Virginia Medical Monthly

Official Organ of the Medical Society of Virginia

Vol. 55, No. 9.
WHOLE No. 918.

RICHMOND, VA., DECEMBER, 1928

20 CENTS A COPY
$2.00 A YEAR

MANAGEMENT OF THE ESSENTIAL FEATURES OF IMPAIRED KIDNEY FUNCTION.*

By GARNETT NELSON, M. A., M. D., Richmond, Va.
Medical Department, McGuire Clinic.

Any attempt at affecting in any way the various functions of the kidneys entails an acceptance of some theory of normal kidney physiology, and an understanding of the factors more or less harmoniously involved in accomplishing their work. Broadly speaking, the work of the kidneys consists in eliminating certain substances from the blood stream, especially the end-products of proteid metabolism, and at the same time holding back certain other substances, entirely or in part, for example albumin and urea,—that is, in maintaining a certain percentage composition within the blood plasma; in regulating the osmotic relations in the tissues; in helping to keep constant the volume of the circulating blood; and in helping maintain a fairly constant acid alkali balance. As a talking point, we accept Cushny's theory, confirmed by Richards with his capillary pipet, that the normal kidney physiology in the glomeruli is a selective filtration, purely an excretory process; that as the filtrate passes down the tubules there is a concentration of this solution by absorption, chiefly of glucose, urea, salts and water, and also a definite secretory function, namely, the synthesis of ammonia, hippuric acid, and perhaps certain other nitrogenous compounds. The synthesis of ammonia is of particular interest in that it is not only an eliminative process, but is also a part of the method of protection against the loss of fixed alkali, varying directly with the hydrogen ion concentration, and inversely with the volumes per cent of carbon dioxide. In the presence of carbon dioxide as high as 80 volumes per cent, the kidney ceases to form ammonia altogether, and it is by this peculiar functional ability to vary according to the needs of the occasion that protection against a tendency to either acidosis or alkalosis is to some extent afforded.

Before taking up the question of our ability to influence kidney function, we should refresh our memories on one other point, namely, that the two kidneys contain a vast number of glomeruli, about 4,000,000, each with its own tubule, that normally the glomeruli do not all function at the same time, that all of the units in one kidney and a third of the other may be at absolute rest or destroyed, and all kidney function necessary for perfect health may go on very well. The normal function of any one glomerular unit depends on several factors: 1. The condition of the epithelial cells in the capsule and tubules; 2. The permeability of the capillaries of the glomerulus: 3. The composition of the blood plasma within the capillaries; 4. The pressure and especially the speed with which the stream is flowing; and 5. A nervous mechanism working entirely probably by its effect on the rate of flow and the pressure.

All kidney therapy must be aimed at one or more of these factors, and success or failure is in proportion to whatever special influence can or cannot be obtained. Other things being equal, if we can speed up the flow of blood through the capillaries, we can increase the total urinary output, or, if we can increase capillary permeability, certain substances will come through at lower concentrations, etc.

We see, therefore, that the management of impaired kidney function depends on at least a reasonably clear understanding of exactly what function is at fault, and, as far as possible, why; and the folly of relying on urinalyses alone to determine our efforts becomes obvious. At the risk of being indicted for vain repetitions, we must inveigh against this still too common practice of relying on urinalyses as guides in kidney problems. It cannot be done. Proper clinical histories, thorough physical examinations, and analyses of retention, ability to concentrate, latent edemas, etc., are essential. It is just as wrong to treat

*Read before the fifty-ninth annual meeting of the Medical Society of Virginia, at Danville, Va., October 16-18, 1928.

radically those who need little or no treatment as it is to neglect those who are seriously ill. For example, a focal nephritis may show a large amount of albumin and numerous casts, and yet the number of healthy glomerular units be so great that kidney function is in no other way affected or, on the contrary, a single urinalysis of a specimen from an arteriosclerotic kidney may show in the urine nothing more than a low specific gravity, a trace of albumin and an occasional cast, and lull the careless physician into false security. The possible insignificant urinary findings in serious disease should be especially borne in mind by the obstetrician advising a woman contemplating pregnancy, or a surgeon planning operations of election.

Understanding the underlying principles of kidney therapy as far as they are understood by anyone is not a very difficult matter, and we should adopt some simple classification of kidney pathology, pigeon-hole the functional disturbances accordingly as far as possible, and standardize rules of management.

The whole question of kidney disease has been greatly clarified during this century, particularly in the last few years, and new items are being gradually added so that it is necessary to follow the literature fairly closely. Still, practically all we need add to the classification of disease that we were taught at college is an understanding of what is meant by focal nephritis and nephrosis.

Focal nephritis is a glomerular nephritis involving one or more glomerular units in one or both kidneys, with albumin, casts and blood, perhaps pretty free bleeding, but possibly no symptoms nor signs of uraemia and an unaltered kidney function.

Nephrosis is a degenerative tubular process, possibly a systemic metabolic disturbance, with the kidney involvement as its chief manifestation in the light of our present knowledge. In the first few days of acute nephrosis, and fairly indefinitely in chronic nephrosis, the glomerular function may remain undisturbed, and, despite the large amount of albumin in the urine, the casts and high specific gravity, and perhaps rather extensive edema, there may be no hypertension, no cardiac hypertrophy, no secondary anemia, no retinal changes, and no indications of uraemia whatsover. With the exception of a raised cholesterol content and an altered relation of globulin to albumin the blood chemistry may be expected to remain within normal limits. The most familiar illustration of acute nephrosis is that of bichloride poisoning. Of course, if the tubular degeneration and blockage are extensive enough to accomplish a complete anuria, the uraemia soon parallels that of any other suppression.

It is in these two conditions that danger of over-treatment must be guarded against, especially in regard to the intake of proteid foods, meat, eggs, etc. When a patient with nephrosis comes in complaining of exhaustion and loss of weight, stating that he has had no meat for several months, and the daily loss of protein in urinary albumin amounts to ten or fifteen grams, the reason for his exhaustion and loss of weight becomes apparent. Allowing a liberal proteid diet will do the kidney no harm and may restore his strength and weight. A very simple method of handling the protein intake is the point system, in which a point represents four grams of protein, and tables of foods are prepared with the proteid content of each article worked out so as to state the number of grams of protein in certain weights or volumes of food. The patient is allowed so many points daily. Eight ounces of milk, for example, contains two points, i. e., eight grams of protein. In regard to milk, as has been frequently pointed out, it will not suffice by itself as a diet for any form of impaired kidney function. There is too much protein for nitrogen retention, and too much salt and water for edema.

The details of functional treatment cannot very well be separated from a consideration of the whole organism. This is axiomatic, and no more true of kidney disease than many others. In pneumonia, for example, the problem is to keep the patient alive long enough for recovery to take place of itself. So, also, particularly in acute nephritis, or even more especially in acute nephrosis, as in bichloride poisoning, if we can sustain life long enough, complete recovery with complete regeneration and restoration of function may supervene. In fact, there is a sharp contrast in favor of kidney therapy, for, though in pneumonia respiratory function may be unaltered and unmanageable, in nephritis we may activate, continue or completely restore kidney function. Two general rules should be repeated: 1. When we have nitrogen retention and no

edema, limit the protein intake, and force water—a gallon or more is not too much; 2. When we have edema and no nitrogen retention, inhibit salt, restrict fluid intake, and do not worry about proteins.

It is well to bear in mind that functional disturbances may be out of all proportion to true kidney pathology. For example, in enlarged prostate with retention, ureteral pressure may be so high that capillary permeability is impossible, or in unilateral ureteral stricture the kidney on the opposite side may shut down. Proper relief of back pressure will restore function on the one hand, and some stimulating diuretic, such as novasurol, may reactivate inert glomeruli on the other, converting suppression into free diuresis.

The diuretic value of water is not hard to understand, provided we bear in mind the factors involved in the action of any one glomerular unit and also the tremendous kidney reserve, that is, the number of glomerular units that may be idle. In uraemia water dilutes the blood plasma, rendering it more filterable, and increases the volume of blood, improving the function of each glomerulus, and bringing perhaps a million or more inert glomeruli into action. This is too important to pass over without more emphasis, and so simple that the real mystery lies in the lack of universal application. Profound uraemia with very high nitrogen retention may at times be entirely cleared up by forcing water alone, provided it is really forced, i. e., a quart or more given intravenously several times daily.

Rest or exercise, fresh air, relief from mental strain or strenuous business cares, bodily warmth and comfort, tepid baths or hot packs group themselves intimately. In passing, let me again stress the importance of careful history taking. I allude particularly to the questions of occupation and habits. It is always necessary to go into details and get a clear mental picture of the daily activities of each individual patient, and give due consideration to their possible influence on kidney effort, arteriosclerosis, cardiac work, or hypertension. In severe uraemic intoxications, absolute rest in a warm, quiet, well-ventilated room is essential, and hot packs, if unaccompanied by excitement, are indicated. Induced sweating aids definitely in elimination. It has been shown that the skin may assume compensatory activity, getting rid in the course of twenty-four hours of at least 0.2 gm. of nitrogen. The directions for the management of early impairments, with little or no edema, trifling nitrogen retention, little elevation of pressure, soft arteries, and no hypertrophy, must be worked out, giving due consideration, as was said above, to occupation and habit, and laying particular stress on the amount of exercise to be allowed. It is probably true that the commonplace expression, "You need exercise", used indiscriminately, frequently shortens life.

When we come to a consideration of kidney rest in severe acute processes, we are, of course, compelled to think in relative terms only. No matter how severe the inflammation may be, and no matter how desirable absolute rest may be, it is manifestly necessary in the presence of retention to force kidney function by whatever means we may, trying first one thing and then another, always bearing in mind the several factors involved in the normal action of glomerular units, and directing our efforts towards some special effect. Very simple measures may accomplish startling results. For example, in mercurial nephrosis with associated cessation of filtration and complete suppression, a single intravenous injection of normal salt solution may whip the glomeruli into action and enable us to sustain life until regeneration within the tubules occurs. Functional suppression with impending death, as from obstruction of one ureter, with contra-lateral sympathetic anuria, may, as was said above, be interrupted and free diuresis accomplished by the direct action on the glomeruli of one of the new mercurials, such as novasurol or salyrgan; or, another illustration, complete suppression associated with shock, as from a severe automobile accident, that has lasted several days in spite of rest, warmth, small doses of morphine, and digitalis, may be overcome by activating filtration with glucose, water and insulin. We have recently seen exactly this state of affairs. Within one hour from the time the injection of glucose was begun, seven ounces of urine were voided, and from then on kidney function proceeded normally. Here water diminishes the concentration of substances in solution in the blood plasma, reduces its viscosity, and itself stimulates the glomeruli; glucose furnishes heat and energy to the walls of the capillaries, capsule and tubules, and insulin,

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acting as a hormone, aids the tissue enzymes in their use of glucose.

In cardiac decompensation with insufficient speed of flow through and insufficient pressure within the capillaries, accompanied by general edema and massive accumulations in the serous sacs, we may at times control at will the total daily urinary output by rest, warmth, fresh air, restricting salt and water and using digitalis, ammonium chloride or nitrate, and mercury. In regard to digitalis, it should be remarked that very high systemic pressure is not necessarily a contraindication to its use. It is more a question of cardiac rate and rhythm and standardization of pressure. Allusion might be made to a case of generalized edema with pulmonary congestion, marked dyspnoea, and very scanty urine, having tachycardia and arrhythmia of rate and force, in which the only drug therapy was giving twenty-two grains of digitalis in forty-eight hours and four theominal tablets daily. The highest reading at which any sound came through below the cuff was 260, and there was no point at which all cardiac movements produced a sound. By the third day the heart rate was 70, there was no arrhythmia, the pressure had fallen to 220, and there was marked diuresis, with relief of all symptoms.

The contrast between the effects of sodium chloride and ammonium chloride might at first thought be confusing, but clears up pretty well when we consider that sodium chloride is a strong basic salt, whereas ammonium chloride is very high in hydrogen ions and readily breaks up to aid in the formation of urea.

We know that the average adult carries about 300 grams of salt in his various tissues, that the blood can contain only 25 to 30 grams of the total chlorides, and that the concentration in the plasma must be kept at a fairly canstant level. A concentration as low as 200 m.g. per 100 c.c. cannot be endured and a marked hypochloremia may of itself be fatal. This is incidentally one reason that bowel obstruction above the colon is so much more desperate than down in the colon. Chloride entering the stomach by mouth, or secreted in hydrochloric acid must reach the large bowel for absorption into the plasma.

The presence of edema from retention of salt and water is in some way influenced by the acid alkali balance. Sodium chloride increases the akaline tendency, and ammonium chloride must overcome this and produce an acidosis before it can pull salt and water out of the tissues and cause diuresis. This is, of course, not the whole truth in regard to edema, but merely an attempt to explain the contrast between the effects of sodium and ammonium chloride in so far as the two salts have to do with edema.

There are two other matters to think of,—the possibility of influencing the nervous factor in kidney function, and the glands of interal secretion. In regard to the nervous factor, there is not a great deal to be said. We know that emotional disturbances, particularly fear, cause diuresis, and we know that prolonged mental strain has to do with hypertension and chronic nephritis. but we know of no way to stimulate or depress this or that nerve and get definite results. Of the glands of internal secretion still less is known. Adrenalin, though raising systemic pressure, does not cause diuresis. Insulin aids in the use of glucose. Pituitrin regulates the output in diabetes insipidus. In the light of our present knowledge, these latter two are the only practical points in the use of the products of the glands of internal secretion.

In conclusion, it may be said that:

1. The essential factors of kidney function are to a great extent subject to direct control.

2. Prolonged kidney efficiency and life extension can be accomplished by attention to diet, occupation, habit and the hygiene of daily life.

3. The composition of the blood plasma, that is, its capacity for filtration, may be influenced, especially by diet, salt and water.

4. The speed of flow and pressure within the capillaries may be improved, especially by digitalis in cardiac decompensation.

5. The number of glomerular units in action may be increased, or the action of inert units stimulated, by water, salt, glucose, ammonium chloride, mercury, as well as in other ways.

REPORT OF A CASE OF BI-LATERAL CYSTIC KIDNEY.*

By LAWRENCE T. PRICE, M. D., Richmond, Va.

This patient, a woman, thirty-nine years of age, entered the Johnston-Willis Hospital July 19, 1928, with the complaint of pain in

*Read before the fifty-ninth annual meeting of the Medical Society of Virginia, at Danville, Va., October 16-18, 1928.

the abdomen. The following history was obtained:

Two days previously she was seized with a sharp pain in the right abdomen, accompanied with a dull dragging sensation. After a few hours quiet in bed the symptoms disappeared. The attack of pain was repeated on the following day. Before, during, or following the attacks, there was no alteration in the volume of urine, or frequency of urination, and no pain upon voiding. The urine appeared to be normal in character. Patient stated that she could palpate a mass in both sides of her abdomen which she had observed for the past five years. The mass, according to the patient's observation, varied in size.

Patient stated that she had her first attack about five years ago, and the attacks had recurred on the average of every five or six months. These attacks would last one or two days. During the first two years the attacks would be followed by a hematuria.

Patient is unmarried, has been fairly active, and has been employed as a secretary for a number of years. Her weight has remained, for about fifteen years, around 140 pounds. Appetite good and has enjoyed good health, other than attacks of abdominal pain above referred to, and malaria two years ago.

Past History: Usual childhood diseases. No history of pneumonia or typhoid fever.

Family History: Mother living and well. Father died of heart disease. Five brothers living and well. Two sisters living and well. No history of tuberculosis or cancer in family.

Physical Examination: Middle aged woman, slightly undernourished but well developed. Head and neck grossly negative. Chest—Sides symmetrical; ribs prominent; breasts moderate in size, consistency soft, no masses felt. Lungs—expansion free and equal; percussion, resonant throughout; ausculation, breath sounds vesicular. Heart—not grossly enlarged, sounds are clear and distinct, with no murmur elicited; extrasystole every four or five beats. Abdomen—General shape of abdomen oval with a bulging of abdominal walls on either side just below costal margins, extending to iliac crests. Palpation, firm mass, not tender, felt on either side of abdomen, extending from costal margins to one inch of mid-line, with curved surface to iliac crests. This mass is dull on percussion. Extremities essentially negative.

Urological Examination: Cystoscopic—Bladder negative for stone, ulcer, tumor, inflammation and pathology of any kind. Both ureter openings normal in appearance. Catheter introduced into right ureter and kidney 45 c.m. (about three inches further than normal) showed that urine flowed very freely from this catheter. Catheter was introduced in left ureter for 20 c.m., it being impossible to introduce the catheter further; secretions were very scant from this catheter.

Laboratory: Bladder specimen of urine—straw; clear; acid; 1,004; faint trace of albumen; sugar negative; rare epithelial cells and leukocytes. Right kidney specimen—frequent epithelial cells and leukocytes. Culture negative. Phthalein appearance nine minutes; fifteen minutes trace. Left kidney specimen—many epithelial cells, occasional leukocyte. Culture negative. Phthalein gave no appearance in twenty-four minutes; remaining portion first hour, phthalein 8 per cent; second hour, 12 per cent; third hour, 4 per cent.—total 24 per cent. Hb. 73 per cent; red cells 4,290,000; leuc. 5,300; P. 83; S. L. 17. Blood sugar 90.9; N. P. N. 25.0; creatinin 2.72.

Twenty c.c. sodium bromide solution were injected into pelvis of the right kidney and 23 c.c. into pelvis of the left kidney and a pyelogram was made.

X-Ray Report: Right kidney: outline of right kidney not made out on films but negative for calculus. Left kidney: outline of left kidney not made out on films but negative for calculus. Ureters and bladder are negative for calculus. After introduction of opaque catheters and injection of sodium bromide solution, the left ureter is seen to take a normal course up to the lower margins of the transverse process of the third lumbar vertebra. At this point the catheter passes outward and downward to a point one inch above the crest of the ilium. The pelvis of the kidney is markedly enlarged. The calices are destroyed. The size of the kidney is approximately six inches in length, the diameter being approximately five inches. The left kidney and ureter take a normal course which reaches a point corresponding to the upper margin of the body of the fourth lumbar vertebra. At this point there is a distinct kink in the ureter. There are two filling defects noted approximately one inch from this kink measuring five by three m.m. in diameter. The pelvis of the kidney

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is markedly enlarged and flattened. The upper calices are markedly enlarged; the middle calices are completely destroyed; the lower calices are slightly enlarged and blunted. Size of left kidney 6x5½ inches.

Conclusions: The patient has a polycystic kidney on both sides of considerable size. Taking the history of the case into consideration, it is presumed that they are benign in character. The functional ability of the right kidney is below normal and that of the left is practically not at all.

Diagnosis: Cystic tumors of both kidneys.

A brief summary of the literature on this subject may be interesting.

Several theories have been advanced regarding the formation of polycystic kidneys, and, of these, three deserve mention. According to Virchow,[1] the cysts are due to retention resulting from a closure of the papillary ducts by deposits of uric acid and calcium salts. Virchow later modified this view, believing that the closure was due to an inflammation of the papillae; hence the term "nephropapillitis." This view has now been completely abandoned, owing largely to the experimental studies of Petterson[2] and Tollens,[3] who have shown that obstruction of the papillary ducts is followed not by cyst formation, but by an atrophy of the tubules.

The neoplastic theory of Bridigi and Severi[4] received considerable support and has not yet been completely given up. These investigators noted epithelial proliferation or sprouts from the tubules of the kidney into the connective tissue surrounding them, epithelial nests, which they thought became converted into cysts through degenerative changes, and pseudopapillary formations on the inner walls of many of the cysts. The conditions showed marked similarity to that found in cystadenomas of the ovary, and they advanced the idea that it was a true neoplasm.

The third view is that of Hildebrandt,[5] who based his conclusions upon our present-day conception of the dualistic formation of uriniferous tubules. He believed that the cyst formation is due to a failure of the union between the collecting tubule and the metanephrogenic anlage; with the beginning of secretory activity of the glomerulus and kidney tubule, a cyst is formed. This view was confirmed by Ribbert,[6] Meyer,[7] and many others, and is today the most generally accepted theory of the formation of polycystic kidney.

However, the question is not entirely settled as yet. The studies of Von Mutach,[8] confirmed by Bunting,[9] have shown that a direct continuity could be traced between the cysts and the kidney tubules. Berner[10] found carmine within the cysts after its injection into the ureter. Greene[11] has made wax models of the uriniferous tubules in this condition, as well as isolating them by the hydrochloric acid maceration method, and finds direct continuity between the cysts and the collecting tubules. He concludes that retention alone is insufficient to explain the mode of formation of the cysts.

The frequency of polycystic kidney is given by Nauman,[12] who found sixteen cases in 10,177 autopsies; of these fourteen were bilateral. Sieber[13] has collected 244 cases from the literature, of which the age incidence is given as follows.

8 weeks	to 19 years	32 cases
20 years	to 29 years	26 cases
30 years	to 39 years	22 cases
40 years	to 49 years	67 cases
50 years	to 59 years	40 cases
60 years	to 69 years	10 cases
70 years	to 79 years	6 cases
80 years	to 89 years	2 cases

He finds that the condition occurs bilaterally about ten times more frequently than unilaterally.

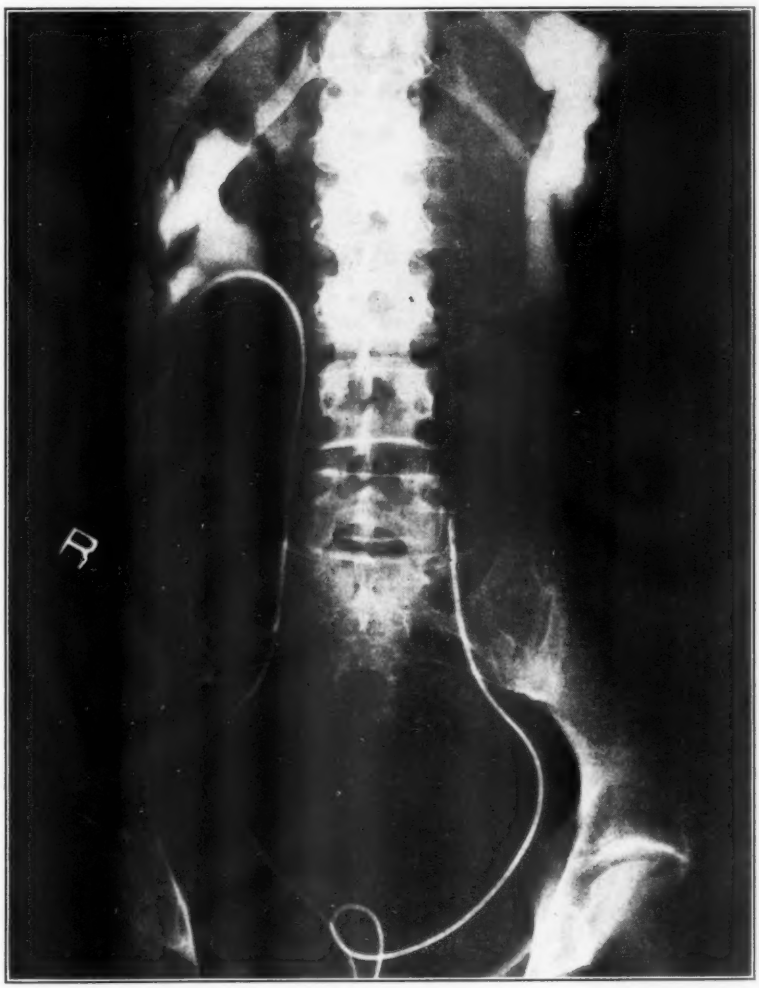
A marked hereditary tendency has always been noted. This is strikingly shown in two families described by Steiner (cited from Sieber). In one family, the father, ten-year-old son, and sister of the father had polycystic kidneys; in the second family, the father, son, and three sisters of the father were so afflicted, while, in addition, several of the children showed albuminuria.

One of the most common symptoms of the disease is pain. This may occur over a period of years, may come on as a late symptom, or may be entirely lacking. It is usually of a dull aching character and is probably due to the increased size and weight of the kidneys. Hematuria, of an intermittent character associated with pain, lasting for several days or weeks and followed by a complete remission, occurred in about one-half of the cases collected by Sieber. The urine may or may not be normal, depending upon the amount of normal renal tissue left between the cysts. Al-

buminuria may occur, but is inconstant; casts are seldom seen, red and white blood-corpuscles are found in small numbers.

Of the physical signs, a palpable tumor is the most important. The kidney is felt as an irregular, hard, compact, enlongated mass, having an irregular surface. Fluctuation is absent and this sign has been used to distinguish the condition from hydro- and pyo-nephrosis. The finding of bilateral palpable kidney tumors is of great importance, but is not pathognomonic, as Rohrer (cited by Sieber), in a series of thirty-seven kidney neoplasms, found this condition to be bilateral in five.

The pyelogram is a most important aid in the diagnosis of polycystic kidney. In the usual form, where the cysts are mostly in the parenchyma, the kidney is enlarged in all directions. The effect on the pelvis is most marked in the longitudinal direction, while the calices at either pole may be spread apart.



Bilateral pyelogram of the case reported.

The characteristic lengthening of the pelvis, without any dilatation, is pathognomonic. More rarely, if large cysts develop in the lowest portions of the columns of Bertini, the calices may be stretched out over their surfaces, elongated, and converted into thin convex slits. This may cause in the pyelogram

the appearance of thin lappets like those produced by the invasion of the pelvis by a tumor mass. The remainder of the pyelogram will, however, usually give the diagnosis of polycystic kidney.

The urine is usually abundant and of low specific gravity. Hematuria, albuminuria, and cylindruria may occur. When renal insufficiency becomes marked, any of the symptoms of uremia may be present, and retention of the urinary constituents in the blood will occur.

The distinction which was formerly made between polycystic kidneys of the adult and those of infancy and early years is no longer held. The tumors are believed to be present at birth, but may not begin to grow until after middle age.

Three types of clinical course of the disease are distinguished by Sieber,[14] although various combinations of these are found. The first is the uremic form with an insidious onset, systemic symptoms of uremia, with death after eight to twenty days. The second is the Bright's form, which is characterized by symptoms of chronic nephritis—cardiovascular changes, edema, albuminuria, etc. This form runs a much longer course, as high as twenty years. In the third type, the renal or surgical form, the symptoms are referable directly to the kidneys—hematuria, lumbar pain, etc. The course is variable, there are attacks and remissions, and it averages about three years in length. Death is due to uremia.

A polycystic kidney may be the site of practically any other renal disease, as calculus, hydronephrosis, pyelonephritis, tuberculosis, etc. When this occurs the problem is much complicated.

The treatment of polycystic kidney is generally a medical problem, the guiding principles of which are the same as for chronic nephritis. The patient should lead a very careful life as regards exercise, food, drink, and exposure to cold. He should be seen occasionally by his physician and a careful urinary examination and functional tests made to determine the progress of the disease.

When it is definitely determined that the condition is gradually becoming worse, the question of operative intervention must be considered. Much has been written upon the subject and there is still much doubt as to what is the best method to pursue.

In an excellent study of the subject, Brin has found that nephrectomy has been carried out in seventeen cases. The mortality has been so high that this procedure stands condemned. In twenty-two cases of nephrotomy or nephrostomy the mortality has been 31.8 per cent. Only two patients are reported still alive after two years. Nephropexy and decapsulation have been done a few times. The most efficient procedure has been puncture or incision of the cysts. The method of puncture has been championed by Rovsing, who advises that the kidney should be exposed and multiple punctures of the superficial and deep cysts carried out. In two cases Rovsing reported that remarkable amelioration had occurred, that the renal function was considerably improved, and that pain, which had been present, had disappeared. Other surgeons have confirmed these results, while some have reported failures. Kuster recommends that the superficial cysts be excised as completely as possible. The incision may be done with or without cauterization. Brin collected sixteen cases, treated thus, with four deaths (25 per cent mortality). The duration of the results in those who lived cannot be given. When the case is complicated with unilateral infection and suppuration, a calculus with hydronephrosis or tuberculosis, operation may be indicated and perhaps safely carried out on the affected side, but the fact that the other kidney is practically always polycystic makes any extensive operation hazardous. When fever, associated with anuria or uremia, occurs, one may consider operating upon a badly infected side, but, as a rule, such operations are dangerous.

One may, therefore, sum up the situation in advising that medical treatment as a rule is the method of choice. In some instances surgical evacuation of the cysts may be justifiable. One connot as yet state what methods are best to employ or what results may be expected.

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A CASE OF TUBAL TWIN PREGNANCY.

By
H. E. JORDAN, PH.D.,
and
R. H. MEADE, JR., M. D.,
University, Va.

The rarity of recorded instances of tubal twin pregnancy would seem to make desirable a brief report of any additional cases. A recent examination of the literature by Arey (*Anat. Rec.*, Vol. 23, 1922) revealed only forty authentic cases. Arey's analysis of this material shows that tubal monochorial twins occur twice as frequently as dichorial twins. This preponderance of monochorial over dichorial tubal twins he ascribes in part to secondary fusion of originally dichorial twins, and in part to conditions of inadequate oxygenation acting as causative factor of monozygotic twinning.

Clinical History.

A twenty-two year old married white woman entered the University Hospital on April 23, 1928, complaining of pain in the right lower quadrant of her abdomen. Three weeks before, after a long automobile ride, she had had a short attack of severe lower abdominal pain associated with nausea and transitory faintness. A few days later she had another attack of nausea and of pain with localization in the right lower quadrant of her abdomen. The attack that brought her to the hospital began two days previously and was similar to her former ones except that the pain continued. She had had similar attacks two years before and one year before. Her last menstrual period had been on March 4th. Her menstruation had always been slightly irregular since its establishment at the age of thirteen. She had had one pregnancy resulting in a miscarriage, one and a half years before admission.

Examination on admission showed the following positive signs: moderate tenderness and slight spasm of the right lower quadrant of the abdomen, slight reddening of the cervix uteri with a slight leucorrheal discharge, and tenderness in the right fornix. Temperature was 99° F., and leukocyte count 6800. Operation was deferred. The next day her pain having slightly increased and there having appeared slight uterine bleeding, operation seemed indicated. Pre-operative diagnosis was acute appendicitis with salpingitis as a possible alternative. Operation was done under general anesthesia by Dr. W. J. Rollins. On entering the peritoneal cavity slightly cloudy free fluid was encountered and the appendix was found to be enlarged, edematous, and slightly reddened. After removing the appendix, the right uterine tube was brought into view and found to be reddened and enlarged in its middle portion to three times its normal size. This tube was removed and found to contain a blood clot 3 cm. in diameter with a definite sac and two small objects thought to be embryos. The pathological diagnosis was chronic appendicitis and tubal pregnancy. Following the operation the patient made an uneventful recovery.

Microscopical Study

Microscopical examination of the material confirms the macroscopic diagnosis of tubal twin pregnancy. The single chorionic vesicle has an internal diameter of approximately 25 millimeters. It contains no reticular magma. The enveloping shell of blood clot has an average thickness of 5 millimeters. This includes a few scattered chorionic villi in the region underlying the embryos. The villi are covered with a considerable layer of plasmodiotrophoblast. The cytotrophoblastic layer is in process of disappearance. The villi have the general histology of approximately the eighth week of pregnancy. The core appears fibrous and contains a few capillaries with scattered normoblasts.

The two embryos are separated by a distance of 10 millimeters. Each is adherent to the underlying chorion; and each is closely enveloped by an amnion. The twin pregnancy is apparently of the monochorial (monozygotic, uniovular) type. If it had been originally dichorial (dizygotic, biovular), one would expect to find some persistent indication of secondary fusion of two chorionic vesicles at this relatively early stage of gestation.

The embryos are of quite dissimilar size; the smaller measures approximately 4 mm., the larger 7 mm. Macroscopically, the smaller appeared to lie on its back; a cephalic indentation was interpreted as the oral sinus. This orientation could not be confirmed in the sections. The abdominal organs had largely disappeared over the area of fusion. The larger embryo presented apparently its right side; branchial arches seemed recognizable at the larger end. The sections suggested that a

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wrinkling of the tissue of the atrophic head over an area of fusion gave a deceptive appearance of arches. Both embryos showed indications of considerable distortion and malformation.

Sections of both embryos, including portions of the underlying blood clots, were cut at 8 microns and stained with hemotoxylin and eosin. The sections were prepared by Dr. Elizabeth Cole. No trace of a yolk sac appears in the sections. Only the larger embryo shows an attrached fibrous structure, which may represent the primordium of an umbilical cord. Both embryos are fused over large areas with the underlying chorion. This fusion produces considerable flattening and distortion. The tightly fitting amnions are in part adherent to the embryonic ectoderm. Obviously the body stalks ceased early to lengthen, and the amnions similarly ceased to expand.

The two embryos are at slightly different stages of development. Estimated on the basis of length alone they are approximately thirty and thirty-six days of age, respectively. The microscopic appearance agrees in general with this age difference of six days. Assuming that we are dealing with monochorial twins, as the evidence seems to indicate, the smaller embryo is somewhat stunted in development. The larger embryo probably more nearly measures the maximum gestation time, namely, five to six weeks. It has suffered a considerable degree of disintegration and maceration. The degree of regressive alteration would seem to have required at least a week of post-mortem duration. On this assumption, the pregnancy has an age of approximately seven weeks, a figure which agrees closely with the clinical history and the histology of the chorionic villi.

The most conspicuous structures in the smaller embryo are the neural tube and the myotomes. Especially in the cerebral region is the neural wall distorted. The neuroblasts are in general dissociated and the cerebral canal is practically obliterated. Eyes cannot be recognized in this tissue. Over a few restricted areas in the head region of the smaller embryo the epidermis remains practically normal, and consists of two layers of cylindrical cells covered with a peridermal membrane of flattened cells. Elsewhere skin is apparently lacking. The mesenchyme appears approximately normal except for a variable degree of cellular dissociation. No mitoses occur in these tissues. The mesenchyme contains numerous small thin-walled blood vessels filled with normoblasts.

In the case of the larger embryo the nervous system is only vaguely indicated by an irregular canal filled with a coagulum and outlined by a layer of dissociating pale-staining cells. The head of this embryo has suffered almost complete atrophy. The salient feature of the larger embryo is a voluminous mass of large polyhedral cells, in certain areas separated by wide sinuses filled with normoblasts. This is clearly liver tissue. Several sections contain also a small irregular vesicle lined with quite healthy-looking cylindrical cells, suggestive of intestine. This embryo defies more precise analysis in terms of organs and tissues. Dissociation has proceeded to a degree where only liver, mesenchyme and fetal blood are interpretable with certainty. The underlying hemorrhagic mass contains an excessive number of polymorphonucleated leucocytes, indicative of the degree of the inflammatory process.

Besides adding one more instance to the rare condition of tubal monochorial twin pregnancy, this case seems of unusual importance in that the clinical history reveals the probable causative factor underlying human monozygotic twinning. This individual suffered from chronic appendicitis over a period of at least two years. It is significant that the tube on the right side was the locus of the twin pregnancy. It seems reasonable to infer that the inflammation surrounding the appendix spread to the adjacent uterine tube. An inflammatory condition of the tubal mucosa would operate to impede the descent of a fertilized egg, and thus provide the conditions for tubal implantation. The resulting "faulty implantation" (Mall; Contr. to *Embryol.*, Vol. 1, 1915, Carneg. Inst. of Wash.), imposing a condition of inadequate nutrition, coupled especially with the presence of a toxin resulting from the inflammatory milieu, would conceivably operate to temporarily arrest development at an early critical stage. The experimental work of Stockard (*Am. Jour. Anat.* Vol. 28, 1921) with fish embryos has shown that when development is interrupted at a stage immediately preceding gastrulation (formation of primitive streak in mammals) by lowering the temperature or decreasing the oxygen supply, and then restarted by a return to normal conditions,

the resulting embryos are largely various degrees of double monsters. Double monsters are essentially incompletely separated uniovular twins. The preponderance of tubal monochorial twins reported by Arey (1922) over uterine monochorial twins, approximately in the proportion of 15 to 1, may well be the result in part, as Arey has suggested, of the operation of the factor of inadequate oxygenation, or of a toxin, effecting an early inhibition of development under the conditions, chiefly inflammatory, which underlie tubal implantation.

DACRYO-CYSTITIS AND ITS TREATMENT—PAST AND PRESENT.*

By FRANK M. HANGER, M. D., Staunton, Va.

For at least several hundred years, the etiology of dacryo-cystitis has been a moot question with the medical profession, and much irrational treatment and many useless and painful operative measures have been devised for its cure. Not till the early part of the present century had it ever been suspected that nasal sinusitis was responsible for fully nine-tenths of the cases of dacryo-cystitis, as a result of extension of inflammation, by contiguity of tissue, from the maxillary sinus, ethmoid cells, or frontal sinus,—the two former lying respectively to the outer side and behind the nasal duct. The remaining cases are generally, directly or indirectly, of nasal origin, caused by repeated infectious inflammations extending up the nasal duct into the lachrymal sac and even through the canaliculi to the ocular conjuctiva. In this process, the nasal duct is more frequently occluded than any other part of the derivative lachrymal passages. This depends, in a measure, on the fact that, when the lining mucous membrane becomes thickened from inflammation, the lumen of the duct becomes closed, as no distention is permitted outward, by the bony canal in which it is encased.

However, it must be conceded that a few cases of dacryo-cystitis are produced by acquired or inherited syphilis, tuberculosis, scarlet-fever, measles and small-pox,—but a very few. Just how the nasal duct becomes permanently strictured is problematical; yet, it is believed that lymph being thrown out, both within and without the duct, and the periosteum becoming involved in come cases, hyperplasia takes place, resulting in not only an organized stricture of the membranous duct, but atresia of the bony canal as well. The stricture is usually found at the junction of the sac with the duct,—the narrowest part of the normal duct. The appearance of acute dacryo-cystitis and blennorrhoea, the chronic form, is too well known to need any lengthy description here. The disease occurs at any age, even the new born infant not being exempt. According to Nettleship, women are more liable to be afflicted than men, in the proportion of nearly four to one. An acute attack is frequently preceded by the chronic form, of some months' or years' duration. The first signs are usually increased lachrymation, a hard circumscribed swelling the size and shape of a horse-bean, in the situation of the sac, with great swelling and edema of the lids. The swelling is red and very painful to the slightest touch. The attack sometimes subsides, but, more commonly, it terminates in an abscess of the sac which points just below the tendon of the orbicularis muscle, as closure of the canaliculi and nasal duct from the inflammation makes drainage from the sac impossible. After nature has evacuated the abscess, relief from pain is pronounced, and, as a rule, speedy resolution takes place. Soon, the puncta and canaliculi become pervious and permit the passage of tears once more into the sac, which, mixed with purulent mucus, empty themselves through the fistulous opening on the cheek. By and by, the lining membrane of the nasal duct becomes healthy and a free passage for the tears into the nose is re-established.

In most cases, such a favorable termination fails to take place. The nasal duct remains obstructed, and, at times, permanently strictured, and the fistula will also remain, and a cure cannot be expected until drainage into the nose is effected by operative procedure. Blennorrhoea, or the chronic form of dacryocystitits, presents a milder and more inviting picture. Barring the danger of an acute attack of the disease, and the danger of the loss of the eye in case of an injury to the cornea from an infected ulcer, the troublesome tearing and the annoyance of constantly wiping the filthy pus from the eye, blennorrhoea might well be ignored, which is often the case with many people thus affected. A circum-

*Read before the Virginia Society of Oto-Laryngology and Ophthalmology, at Newport News, Va., April 28, 1928.

scribed swelling over the site of the lachrymal sac, known as a mucocele, accompanied always with epiphora and usually with a chronic inflammation of the palpebral conjunctiva, and also of the ocular conjunctiva at the inner corner of the eye, are the objective signs. On pressing the sac, if mucus or pus fails to pass through the nasal duct into the nose, and only regurgitates into the eye, it is a strong indication that the duct is permanently strictured.

This causes the mucocele to temporarily disappear, but, as the puncta and canaliculi are patulous, the tears are readily transmitted into the sac, which becomes again distended. Blennorrhoea may come on quite imperceptibly, watering of the eye being the first symptom noticed by the patient. However, it may be preceded by one or more acute attacks of inflammation of the lachrymal passages.

Judging from the writings of the earliest authors, it is quite apparent that none of them appreciated the causes of dacryo-cystitis: 1 Srofula was regarded as one of the chief exciting causes and retarded its cure. 2. Another theory was that it was caused by an inflammation of the Meibomian glands and of the mucous surfaces of the eyelids; the discharge from both sources becoming mixed with the tears was carried into the lachrymal sac, and there set up an irritation of its lining, which brought about an inflammation of the entire drainage system of the eye. This inflammation finally produced a stricture of the nasal duct, resulting in an abscess of the sac, and this was usually followed by fistula lachrymalis. Scarpa was the strongest advocate of this belief, but there were many opponents of this fallacy. The reasons they assigned were—first, that they had observed the fistula lachrymalis without the least morbid alteration of the eyelids and Meibomian glands; second, that every purulent discharge of the eyelids, in fact, almost none of these diseases of the conjunctiva were ever succeeded by dacryo-cystitis and fistula lachrymalis; third, that the fistula was cured by means of an operation, without any attention being paid to the disease of the eyelids which was claimed to cause it. 3. The third cause of dacryo-cysititis, in the opinion of many, was that it was the result of an erysipelatous inflammation of the skin and cellular tissue over the site of the lachrymal sac, resulting in a superficial abscess, which, in unfavorable cases, perforated into the sac and produced all the signs and symptoms of acute dacryocystitis. It is far more probable that, what was thought to be the cause was really the result of an already existing inflammation of the sac.

Past Treatment

The old writers were a unit in believing that stricture of the nasal duct was the cause of the mucocele, abscess, and fistula of the lachrymal sac, and all of their efforts were directed toward the restoration of drainage into the nose. In the acute stage of dacryo-cystitis, cold applications were commonly used over the inflamed area. In some cases, hot fomentations were preferred. Blisters behind the ear and leeches to the corner of the eye and to the entrance to the corresponding nostril, were favorite remedies. When pain was very severe, venesection was generally practiced, while hydrarg. cum creta was the laxative of choice. An early incision was made into the sac, should an abscess begin to point,—thus affording quick relief from pain and diminishing the chances of multiple fistulae. After the acute symptoms had subsided, efforts were begun at once to restore the patency of the nasal duct, by introducing into it cat-gut and silver styles, by way of the fistula lachrymalis, where they were permitted to remain several days, after which they were replaced by larger ones,—the duct being syringed and cleansed each time. Anel devised his probe and syringe in 1716, and both were intended to be used only through the upper canaliculus, but, owing to the small size of the probe and the great difficulty of its passage through the nasal duct, it soon fell into disrepute, and little was accomplished of a curative nature with the syringe, as the solutions passed out through the fistula lachrymalis and not through the duct. Later, in blennorrhoea, Petit conceived the idea of making an opening into the mucocele, and dilating the nasal duct with bougies, with results about the same as in cases where the fisulous opening was used.

Prior to this method, Travers had used graded silver probes, five inches long, which were passed exclusively through the unslit canaliculi, with little or no benefit.

Others attempted to overcome the strictured nasal duct by introducing Gensoul's sound

from the lower meatus up through the duct. This was a very difficult procedure and only resulted in inflicting great pain on the patient,—however much it may have impressed him as to the interest and zeal of the surgeon,—and it speedily fell into disuse.

Others, discouraged by all the devices heretofore mentioned, resorted to perforating the lachrymal bone and establishing an opening from the sac into the middle meatus of the nose; but, this operation also proved a complete failure, because the fenestrated opening soon closed and the cystitis recurred. Finally, in desperation in obstinate cases, some made use of Dupuytren's and Wathen's gold tubes, which bore their names. These were inserted through the fistulous opening in the sac, or through an incision made for the purpose, down into the lower portion of the nasal duct, and the opening was closed with a suture or a piece of adhesive plaster,—the tube to be worn permanently. The tears were immediately and freely carried into the nose, and in a few days, the opening into the sac would close, and the patient was discharged as cured.

But, after some weeks or months, the tube invariably caused irritation and removal became necessary, or the bone surrounding the tube became necrotic and it would be extruded through the nose. Finally, some surgeons, surrendering to what they conceded to be an incurable condition, destroyed the lachrymal sac and nasal duct with escharotics,—a method practiced by the Romans 2000 years ago. Thus, they effected a cure by destroying the seat of the disease. The same execrable surgery is practiced by the lachrymal sac extirpator of today, in a more skilful and less painful manner, yet, with the still small voice of an accusing conscience ever telling him that he did not do all that he should have done for his patient. He did not perform a dacryo-cystorhinostomy, nor did he even recommend this operation which would have probably effected a cure. But, instead, he yielded to the importunities of an anxious patient for a speedy termination of the filthy disease,—a patient whose patience had already been exhausted by the useless and torturing probe, and who had ever been terrified at the possibility of losing his eye, with an infected ulcer, in case of an injury to the cornea.

Present Treatment

And now we come to the point where we must consider the treatment in vogue today, and see what improvement we have made over that of the old surgeons, which we have just reviewed. Owing to a better knowledge of the etiology of dacryo-cystitis, we have a better understanding of the pathological conditions we have to deal with, and are able to treat the disease itself with greater intelligence; at the same time, by removing the causes, we effect a speedier cure. They thought that a scrofulous diathesis was one of the chief causes of the disease, and retarded its cure; whereas, we now know that tuberculosis, syphilis, and nasal infections must be combated, along with drainage, before we can expect good results.

Owing to the fact that there are today ten times as many ophthalmologists and rhinologists as there were forty years ago, the number of cases of dacryo-cystitis *per capita* has slowly diminished as time went on, because proper and rational treatment became more accessible and its importance became more impressed on the laity. As a result, nasal sinusitis and infectious inflammations of the nasal passages are treated early, and the greatest common causes being removed, the disease itself is prevented. A larger number of dentists are now found, and with a better care of the teeth, we meet with fewer cases of maxillary sinusitis of dental origin.

However, where the disease is one of long standing, and an organized stricture of the nasal duct is found, with or without bony atresia, the present treatment of wearing styles, and cannulae, and probing through the slit canaliculus is just as irrational and unsuccessful as that of the old surgeons when done through the fistula lachrymalis or through an opening made into the sac,—for such a stricture can only be cured by a dacryo-cystorhinostomy.

Thirty-seven years of trial evokes this dogmatic assertion: When there is merely a thickened chronically inflamed condition of the mucous lining of the duct, and the case has been seen early, it is usually amenable to treatment. Such were the cases cured by the ancient surgeons, and these are the cases the ophthalmologist cures today with probes and irrigation.

Between the years of 1850 and 1875, the

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lower canaliculus was first slit up into the lachrymal sac, and silver probes of increasing size were passed through the nasal duct, and styles and cannulae worn with less disfigurement. This route has other advantages over the old route, as opening the sac in this manner prevents a fistula forming in many cases, which is both disagreeable and unsightly. Besides, probing is more easily done and fluids are injected through the lachrymal passages with greater facility. Some ophthalmologists condemn cutting up the canaliculi,—claiming that it is conducive to the development of epiphora. Many believe this is a false assumption, and that capillary attraction is a theory rather than an essential factor to the drainage of tears. For, in cases of paralysis of the orbicularis muscle, though the puncta are in a natural position and in apposition with the globe of the eye, epiphora is always present. The tears are drawn into the sac by the action of the orbicularis palpebrarum and Horner's muscles squeezing the sac and forcing the tears down into the nasal duct. This produces a vacuum in the sac, which, in turn, draws the tears from the eye on the same principle that a rubber ball syringe acts,—the canaliculus being the nozzle. The ciliated epithelium which lines the lachrymal passages assists, to some extent, in carrying the tears into the nose, and gravity must also be considered. Hence, many think that as long as the nasal duct is open, there will be no epiphora,—although the canaliculi are slit.

To illustrate further, the dacryo-cysto-rhinostomy, which was reported by the author in the June *Laryngoscope* of 1925, calls for slitting the lower canaliculus and also cutting up the nasal duct into the lachrymal sac; yet, drainage was, and now is, perfect in every case operated, with not the slightest epiphora.

In an acute case of dacryo-cystitis with a painful and swollen sac, the lower canaliculus should be slit up freely into the sac, and same washed out with boric acid or normal salt solution, using a small smooth-pointed glass eye-dropper, the gum bulb of which is securely tied to the barrel. With this, the irrigating solution can not only be injected into the sac, but its muco-purulent contents can be sucked out, which, in some cases, is too thick to be expressed. This simple device will supplant the Anel syringe, if once tried.

Never attempt to pass a probe, after washing out the sac, for several consecutive days. By that time drainage may have been re-established, and probing the nasal duct will be unnecessary. By promptly opening the swollen sac, as above described, much relief will be experienced by the patient, and a fistula lachrymalis prevented. Should the nasal duct now remain impervious to the pressure of the injected solution, a few drops of a 10 per cent cocaine in adrenalin chloride solution, 1 to 1000, should be injected into the sac, and held under pressure for a minute or two. This should blanch and thin the lining of the sac and nasal duct to the extent of permitting an irrigating solution to pass into the nose,—if there be only a congestive obstruction. If the solution cannot be forced through, though considerable pressure is used, the chances are there is an organized stricture of the duct. Now attempt to pass a No. 6 or 8 Bowman probe,—not larger or smaller. If it passes easily, there may still be a thickened congestive occlusion. If it can be passed only with considerable force, there is probably an organized stricture of the membranous duct with possibly a bony duct atresia. Use probes, but never pass a canaliculus knife into the nasal duct in order to divide a stricture. It is unnecessary and as dangerous to the integrity of the duct as the passage of a knife into the male urethra to sever a stricture, without having previously passed a filiform bougie for a guide. A false passage is almost certain to be made, and a curable obstructed nasal duct converted into an incurable strictured one.

The same criticism can be made of large lachrymal probes. Where there is a slight stenosis of the bony canal, the attempt to pass a probe too large cannot but crush and injure the membranous duct against walls of the canal and invite an organized stricture. In these acute cases, you should encourage and invite drainage, rather than force it with heroic measures. In those cases where epiphora only remains, and no mucus or pus can any longer be found in the sac, yet, the thick chronically inflamed lining of the nasal duct will not permit normal drainage into the nose, although the irrigating solution may pass readily with the use of the syringe, and if a No. 6 or 8 Bowman probe can be passed without force and without any trace of blood on

its removal, the best treatment is to inject every other day, a few drops of a 2 per cent solution of nitrate of silver into the sac and nasal duct, and, in a few minutes, irrigate the sac and duct with a normal salt solution. Along with this, a Bowman No. 8 probe should be passed about twice a week. As a rule, this line of treatment will overcome the cause of the obstruction.

The best treatment for dacryo-cystitis in infants is masterly inactivity. Although about 1½ per cent of the new born have epiphora or tearing with a little mucus in one or both lachrymal sacs, virtually all get well in a few weeks or months with little or no treatment. It is thought to be caused by delayed absorption of the material which exists in the sac and nasal duct during foetal life, along with a probable bacterial infection.

Expressing the contents of the sac several times during the day, followed with a few drops of a sulphate of zinc solution, ½ grain to the ounce, and placing the child on its back so that the solution will remain in the corner of the eye, seems to hasten a cure. Should the case not yield speedily and the parents become unreasonably solicitous, the sac can be irrigated and a small probe passed occasionally through the dilated canaliculus and nasal duct.

In cases of chronic dacryo-cystitis of long standing—of more than a year,—with a mucocele which can be only emptied into the eye, and, with possibly a fistula lachrymalis as a complication, an incurable organized stricture is almost certain to be found.

The lower canaliculus should be slit up and the patency of the nasal duct investigated, as directed in the acute form, and, so soon as this fact has been established, there is no use to waste time in attempting to overcome the stricture. As before said, nothing but a dacryocystorhinostomy will effect a cure.

All operators who prefer to cure their patients of dacryo-cystitis, instead of mutilating them by extirpating the lachrymal sac, have quite a number of intra-nasal operations to choose from. None of them is as easy to perform as removing the lachrymal sac. Therefore, if they are considering themselves only, and seeking the way of least resistance, their own ease and comfort, and not the interest and ultimate well-being of their patients, they should never attempt one of these operations. Some are more difficult than others, and some too difficult to even be considered. But the one previously alluded to in this article, and reported in the June *Laryngoscope*, of 1925, is by far the easiest to perform and absolutely dependable.

V. Muller & Company, of Chicago, is prepared to furnish the special instruments to the profession at very reasonable prices.

Complete stenosis of the bony nasal duct is rare. But when it occurs as a complication of dacryo-cystitis, the West intra-nasal operation, or one of its modifications, can be performed, or, preferably, the bony stricture drilled through from above, and the Hanger operation done,—but never a dacryo-cystectomy.

It is to be sincerely hoped that should one of you be tempted to extirpate a lachrymal sac, you will first arraign yourself before the bar of your conscience, and ask yourself whether you would prefer your own lachrymal sac to be removed, in preference to having it remain and the tears made to drain once more into the nose,—and then do for your patient what you would have done for yourself. This is what you owe to your patient, to yourself, and to the great medical profession of which you are a member.

And when the long day's task is done and you would rest, there will be no rack of regret to torment you, no spectre arising which will not down at your bidding, and cause you to exclaim, like the craven Macbeth,—"Thou canst not say, I did it: never shake thy gory locks at me."

HEART PAIN.*

By F. H. SMITH, M. D., F. A. C. P., Abingdon, Va.

I suppose there are fifty men in this audience. If there are no more than this, and if the law of averages holds, nine of you will die of heart disease, not including those who will die of the results of arteriosclerosis. Cancer will claim only five of you; Bright's disease four or five; pneumonia three; and so on. This rather lugubrious prediction assumes that the present mortality rates will remain fixed—a rather doubtful assumption, as all indications are fairly clear that the mortality rate of the cardio-vascular diseases for men of the age-

*Read at the session of the Clinch Valley Medical Society, at Tazewell, Va., April 26, 1928.

periods of most of us is increasing disproportionately. In the last generation we have been saving more babies, but we have been losing as many, even more men in the most productive period of life, between 40 and 60. In view of such facts, there need be no apology for discussion of any phase of the problem of the circulatory diseases.

Pain and breathlessness, either or both, brought on by exertion or stress are among the earliest and most frequent symptoms of heart disease. Either symptom marks the progress of the failing heart throughout all of its downward stages. It is of pain, however, as a symptom of heart disease that we are thinking especially at this time.

It shall be my endeavor to present as practical a clinical paper as my subject permits. But I must pause long enough to remind you that the heart as a functional unit consists essentially of its muscle by which its activities are carried on, and of the coronary vessels and nervous mechanism by which the muscle is nourished and its activities are regulated. The nervous control is maintained by the action of the vagus and sympathetic nerves. These nerves have a wide distribution to viscera other than the heart, and through this wide visceral distribution many referred pains are explained. In the heart these nerves are distributed to the sino-auricular and auriculo-ventricular nodes, and are reflected up over the root of the aorta. Efferent or motor fibers appear not to pass beyond the nodes; afferent or sensory fibers are assumed to pass to auricle and ventricle. Sympathetic-nerve action enormously increases activity; vagus action depresses or inhibits activity, even to cessation of all activity. This is the motor response to stimulation. The sensory response to stimulation is that sensation which we perceive in consciousness and express as pain. The receptor and effector centers of this reflex arc are in the spinal cord between the lower cervical and upper thoracic segments.

Our first impulse is to divide heart pain into intrinsic and extrinsic conditions. On further thought, it is doubtful whether this division will hold. How, for instance, under such a simple arrangement, will we class the case of the young individual dying suddenly in the grip of a gall-stone attack; or the occasional instance of instant death on pleural puncture, with healthy hearts? Here the irritation was extrinsic, but death must have occurred by way of the nervous mechanism of the heart.

Perhaps a less objectionable, though admittedly arbitrary, approach will be an attempt to separate out, first, those conditions which may cause an imitation of cardiac pain.

No useful point can be served by attempting a complete list of any of these conditions. My purpose is to suggest rather than to exhaust the possibilities.

Under the head of the imitations of heart pain may be included a very large and varied group or a relatively small one, depending upon how loosely or tightly we apply our definitions. I suggest that we limit the term here to those pains which may be regarded as cardiac, at first sight at least, and yet, on analysis, we are satisfied have nothing to do with the heart, certainly in any direct sense. In effect, this leaves very little to discuss except the so-called "pseudo-anginas."

Again, we run into the practical difficulty of definition. There is no agreement as to the content of the pseudo-anginas. For one, the term means any condition causing genuine pain referred to the heart or precordium, for which there is a real cause not located in the heart. Intercostal neuralgia, and the pre-vesicular stage of herpes zoster are examples.

I once saw an old man who presented a rather striking picture of true angina. Some fever, leucocytosis, suppressed painful breathing and hiccough were odd factors. A patch of left basal pneumonia resolved the doubt in favor of pneumonia and diaphragmatic pleurisy, with phrenic-nerve pain referred to the precordium, the base of the left neck, and down the left arm rather than to the base of the chest.

Painful affections in the distribution of the vagus nerve to the viscera of the upper abdomen much oftener cause confusion. The pain of gall-bladder disease, perforated ulcer, acute pancreatitis, high mesenteric occlusion, even of kidney colic, can just as readily occur about the precordium as heart pains can be referred downward to the upper abdomen. One of the nicest and most momentous problems in emergency diagnosis can arise when confronted with such a differentiation.

Another application of the term "pseudo-angina," frequent and recognized by high

authority, but nonetheless reprehensible, is to the neurotic cardiac group. To list this type of case as a "clinical variety" of true angina, as some text-books do, sometimes embarrasses the clinician when he appears as a court witness, and works incalculable harm to the patient. The laity associates heart disease with sudden death, angina with terrific pain and inevitable death. To pronounce a verdict of "pseudo-angina" upon this neurotic individual, usually young and imaginative, presents to the eye of the victim the picture of the only angina he knows of. Little difference it makes to him whether it be "false" or "true", if he has "angina!"

I wish this term could be dropped from medical literature. Potain has said, "There are no false diseases, there are only false diagnoses."

We come now to consider the true cardialgias, pains which we have every reason to believe originate in the heart, its coronaries, or in the root of the aorta.

Practically every organic disease of the heart may have some degree of precordial pain or discomfort. In the majority this discomfort hardly approaches the degree of pain that can be called severe; it is not usually the most prominent or urgent symptom; nor is it so clearly associated with physical exertion or mental stress as to seem dependent upon these factors. Of this ill-defined character is the pain or discomfort of the myocardial diseases and degenerations, whether primary or secondary to valvular defects; of hypertrophy; or pericarditis, and some others. We expect to arrive at a diagnosis in such cases, not so much on the quality and distribution of the pain, as on the associated subjective and objective evidences of heart disease.

On the other hand, there is a distinct group of cardialgias in which pain is the outstanding, urgent and important symptom of the malady. In this latter group the diagnosis depends upon the recognition of the character of the pain, its quality, location, radiation and the presence of those peculiar mental and physical reactions thereto, all of which we include in the concept of angina pectoris, or, more exactly I believe, the anginal group of heart cases.

It is with this group that we are most concerned in a discussion of heart pain.

In 1768, Rougnon, and, about the same time, Heberden, described cases of angina pectoris. Heberden called this clinical syndrome angina because of the choking, strangling, throttling character of the pain. Ever since, this disease or syndrome has been a bone of contention among clinicians and pathologists. To this day there is no agreement as to the immediate cause of the pain. Huchard, for instance, found sixty-four explanations of angina in the literature, and this confusion exists in the most authoritative texts of today.

In the vast majority of patients dying after one or many anginal attacks some structural defect can be demonstrated. In many this defect is an area of myocarditis, whether more or less generalized or only in spots. More frequently, a segment of aortitis is found, involving the aorta as it springs from the heart, and the mouths of the coronary vessels.

Vaquez finds the explanation of anginal pain right here, namely, in the areas of myocarditis or of aortitis so generally demonstrated. He says that the muscle of the heart and of the aortic ring have the same muscle sense that all muscles have. The pain of angina is the pain of sudden distention. It is an exalted muscle sense that occurs with sudden distention, exalted because of the inflammatory changes at the points designated. He compares this heart pain with the pain of sudden distention of the urinary bladder. How much more likely, then, is pain upon distention of the diseased segment of the aorta or ventricle in which that quality of healthy muscle which we call tonus has been lost or reduced?

In about one-third of the cases which come to autopsy the coronary vessels themselves are healthy. A great many cases, on the other hand, show definite sclerosis or atheroma of all or part of the vessel. Until very recent years it has been the universal custom to regard cases presenting coronary changes as simple angina. Pathologists have recognized them, but it was believed that there is no way by which they could be distinguished during life from angina without occlusion. Now, coronary occlusion, with or without thrombosis, producing myocardial infarction, is recognized as a clinical entity. This is of more than academic interest both from the standpoint of diagnosis and of prognosis.

Herrick divides cases of coronary occlusion into four groups; or we might say that cases

are divisible into groups depending upon the size of the vessel occluded. In the first group are the cases of instantaneous death, in which there is no death-struggle, the heart-beat and breathing stopping at once. I have the notion that death in this group of cases is more nearly instantaneous than any we know of, and that it is the cause of sudden death oftener than most of us realize. In them the main trunk of the coronary is completely occluded.

In the second group death comes within minutes or a few hours. These patients, too, are found dead, or are plainly in the death agony when the doctor reaches them upon a hurried call. The occlusion usually occupies the branch supplying the left ventricle.

The third group comprises cases that survive for days, even months, and then die perhaps with evidences of ordinary myocardial failure; or they sometimes seem to recover. In these last cases we must assume that one of the smaller branches is occluded and that the rather precarious collateral circulation has fortunately become established.

Finally, there is the fourth group, the mildest cases, in which we can only suspect an obstruction of one of the smallest branches. In them the precordial pain is slight, perhaps so slight as to pass unrecognized. Yet at autopsy healed scars of old infarction are demonstrable.

The pain of coronary occlusion of the second and third groups seems to me to be the most atrocious and difficult to alleviate known to man. This is in itself suggestive of occlusion. Given a man in the senescent age, with substernal or precordial agony not promptly or completely relieved by nitrites nor even by extraordinary doses of morphine, coronary occlusion is probable. The pain may radiate into the neck or down the arm, but is more apt to radiate into the upper abdomen. Herein lies a real danger. The patient frequently shows a degree of shock comparable with that of perforation. If he survives a few hours, he usually develops a little fever and more or less leucocytosis. The pain by no means depends upon exertion either for its inception or for its increase, but may develop in sleep; and, also unlike angina, its duration, unless death supervene, is measured by hours or days instead of by moments.

Should the patient with coronary occlusion survive the first twelve or twenty-four hours, it is not unusual to find a small patch of pericardial friction. This spot of pericarditis overlies the area of myocardial infarction, and may explain the fever and leucocytosis. But it, too, is liable to lead one astray by suggesting simple pericarditis. The absence of friction rub, by the way, should not negative the diagnosis of occlusion, as it may have occurred at an inaccessible part of the heart.

After one or more days, symptoms of myocardial failure may ensue to further cloud the picture. An enlarged heart, dyspnea, basal rales, or a swollen liver may be present, and the patient succumb as an ordinary congestive heart case. The previously healthy heart is the one more apt to recover, other factors being equal, whereas the older, previously damaged myocardium is more apt to succumb.

I have spent much time discussing coronary thrombosis and other structural diseases of the heart or vessels, because these constitute the larger part of the whole anginal group. It must be admitted, however, that occasionally the autopsy will reveal no sufficient cause for what has been regarded as the typical symptom-complex of angina during life. Another disquieting item is the more frequent fact that patients who clinically and pathologically display evidences of undoubted structural disease may never have had pain which by any stretch of imagination could be called anginal.

If such be facts, the question at once occurs to mind: Is an organic lesion directly responsible for, or necessary to, the occurrence of anginal pain?

Before answering this question, I should like to mention several conditions of heart pain, and raise the question of their nature.

Certain of the toxic states give rise to pain. I mention tobacco with some hesitation, as it is still a moot point whether tobacco causes true angina. At least, it seems generally conceded that even if tobacco does not cause angina, it may provoke attacks when conditions are favorable.

We know that the convulsions of puerperal eclampsia are sometimes ushered in with violent epigastric pain, and that impending diabetic coma may be mistaken for an abdominal emergency. I once saw a lad go into diabetic coma with thoracic pain which, in an older man, might very readily have been called an-

gina. Upon coming out of coma, when his blood sugar was practically normal, he had no further pain.

I know a young doctor of clean habits and past history, except that he had pneumonia several times in childhood. He has soft peripheral blood vessels, and has never had syphilis. During his senior year in medical college he developed typical attacks of angina, confirmed by several experienced physicians who saw him in attacks. Examination, including electrocardiographic studies, were negative for explanation of this pain, or in detecting evidence of heart disease. Yet his attacks continued. They were associated with a pronounced rise in blood pressure, which would subside after the attack. Finally, he became convinced that he had an abscessed tooth, and had it extracted. Since then, some seven months ago, he has had no further attack. In the meantime he has had an acute attack of tonsillitis, and has submitted to tonsillectomy. He has had a rather strenuous time as a hospital interne, with irregular periods of sleep. He has not greatly or systematically limited his physical exertion.

Has this young man angina pectoris?

Or, recall the occasional victim of toxic goiter who, in addition to the usual heart-hurry, has distinct attacks of anginal pain, with or with fibrillation, and in whom the attacks disappear after the thyroid has been brought under control.

I mention also the anginal attacks of women of the menopausal age, and of the obese individual with or without elevation of blood pressure. We can all recall patients in whom the only explanation of anginal pains forthcoming was grave anemia.

Here we have mentioned a variety of conditions in which cardiac pain may be the only common bond. I suggest that this pain is analogous, if not exactly similar, to the pain of simple angina. This suggestion entails the belief that they have analogous or similar causes.

It is a well known fact that some cases of angina live through many attacks. A few seem to recover entirely. Other cases pursue a steady downward course. Wherein is the difference?

I believe it is not necessary to assume structural disease of the heart or vessels to explain the pain of angina. If such structural disease be present, it acts as a complicating factor, and adds its quota to the gravity of the case. I believe it is rarely the case that one dies in a strictly uncomplicated attack of angina; hence, the rarity of occasions to see such a heart. But what of the cases now living who have had attacks for five, ten or fifteen years?

In some of these cases, undoubtedly, Vaquez' hypothesis of intraventricular and aortic pressure seems best to fit the case. I am thinking especially of the attacks that occur in sleep. The ventricle is surprised, as it were, by sudden distention of its chamber. In the main, however, I fall back on the conception persented by Sir James Mackenzie. He reminds us that if the healthy youngster runs as fast as he can far enough, he will have a sense of constriction through the chest, followed by pain in his heart. This is to all intents and purposes an attack of angina. In this normal youngster, however, the pain must be an expression of a tired or exhausted heart muscle. He, with his healthy heart and with full reserve capacity with normal muscle tonus, will promptly and perfectly recover.

If the normal heart of the youngster expresses pain upon over-strain, it is reasonable to assume that the over-acting thyroid heart, the strained heart of the obese, that of the menopausal woman with her vasomotor imbalance, the anemic heart undernourished by the poor blood quality, and the heart of simple angina pectoris with hypothetical vaso-constriction of its coronaries, will likewise express fatigue in terms of pain. This will occur even more readily, with the less added factor of strain, than in the case of the normal youngster. The cause of exhaustion of the myocardium may vary; the fact of fatigue is common to all.

If this reasoning be admitted, then it is easy to understand that the pain occurring in a diseased heart is also an expression of fatigue.

In a final word, I believe that a more or less typical attack of angina occurs rather frequently, with no evidence of organic heart disease; and that many of these cases recover. I believe that in these cases any organic disease present or developing later is a complicating factor, lending gravity to the prognosis. What

an argument, this is, for getting rid promptly of all those infectious and other factors which induce oganic heart disease!

George Ben Johnston Memorial Hospital and Clinic.

SOME PROBLEMS IN THE MANAGEMENT OF CERTAIN ACUTE INFECTIOUS DISEASES.*

By
JANVIER W. LINDSAY, M. D.,
E. CLARENCE RICE, M. D.,
and
MAURICE A. SELINGER, M. D.,
From the Clinical Laboratories and the Infectious Disease Services of the Garfield Memorial Hospital.
Washington, D. C.

Two factors seem to us to have chief place in justifying the presentation of the material and impressions which follow,—first, the frequency with which we meet the conditions which we shall mention and their serious nature, and, second, our conviction that constant attention to certain details will greatly increase our efficiency in handling them. It is likely that the matters which we shall present are already familiar to all, in their general aspects, but, as we, among ourselves, derive much benefit from frequent discussion of our more common problems, we shall risk presenting some of these problems for your consideration at this time, hoping that we may add at least a little something to our mutual store of fact and theory upon which we must depend for their solution.

We have chosen a list of diseases, each of which is the subject of a large and rapidly increasing literature and any of which might still be considered as merely touched upon if we spent a long session in its discussion. Certain special features stand out, however, in this literature and in the studies which it represents, which it may be permissible to recall or emphasize, either because of the comparative infrequency with which we are called upon to reduce them to practical application, their relatively recent discovery or development, or their more or less uncertain position in the minds of many who have studied them.

We would urge, and continually re-emphasize throughout any discussion of the infectious diseases, the importance of the general examinations and therapeutic measures which so regularly and routinely form a part of the management of other forms of illness. The specificity of the group of conditions in which we are just now interested and the increasing application of specific forms of treatment seems not seldom to tend to submerge or eliminate the well established procedures upon which the efficiency of the specific measures themselves may, in the last analysis, depend.

No specific antitoxin, vaccine or chemical will take the place of nourishment or of a plentiful supply of fluid, and the mere neutralization of a specific toxin may be of little avail if the elimination of other toxins retained as the result of serious renal impairment is not assured or an effort be not made to protect and restore the efficiency of a badly burdened circulation. An appropriate chemical examination of the blood and constant consideration of the state of the circulation are no less important in the case in which we may happen to employ specific treatment than in those in which more general measures may be our sole reliance. We mention the importance of regular and frequent examinations of the urine merely that we may not be accused of seeming to disregard it. In this connection, it would seem that the quantitative method of measuring the albumen, as devised by Exton, has a very distinct value.

Of the so-called general blood examinations, the enumeration of the leucocytes and the differential count are of first importance, and they may, in themselves, not only assist in determining the course of the illness, but they may show that the scarlet suspect is in reality a victim of influenza or measles, or they may prevent the admission of a patient, suffering from measles or German measles, to the scarlet fever ward, in which, if he be susceptible, he may add more serious trouble to that with which he is already burdened.

Two articles, one by Dr. E. C. Rice, published in THE VIRGINIA MEDICAL MONTHLY, February, 1927,[1] under the title "Blood in Scarlet Fever" and one in the last number of the *Medical Clinics of North America*,[2] by Dr. Elizabeth Bass, of New Orleans, give concisely and fully the behavior of the leucocytes under many conditions, including the significant rise of the eosinophiles in scarlet fever and the almost constant rise in the absolute leucocyte count following the use of antitoxins prepared from animal sera. The recognition of this last point is evidently necessary for the proper evaluation of the blood study under the circumstances of our present discussion. The red cell count and hæmoglobin determination are

*Read before the Alexandria Medical Society, May 1, 1928.

likewise essential as signals for the adoption of special measures to restore them to their normal level or to protect them from serious lowering, when possible. Transfusion, with proper regard for contraindications and with due consideration for the possible benefits of selecting an immune donor, may be life-saving, not merely by restoring a lowered red cell count or hæmoglobin value to normal, but also by neutralizing toxins, acting as a bactericidal agent, or by the exercise of properties which, while generally recognized as clinically beneficial, are not susceptible of strict qualitative or quantitative analysis and explanation.

Passing from the more general consideration, we will refer briefly to several diseases of the group of infectious and so-called contagious diseases. With regard to diphtheria, it would seem appropriate to preach toxin-antitoxin prophylaxis, in season and out of season. Upon it depends, without the shadow of a doubt, the control of diphtheria. And it must be emphasized that this is not an emergency measure to be adopted as a protection in time of individual exposure or epidemic alone, but, as early as possible, as a measure anticipating numerous and unknown exposures, by months or years. Inseparably associated with the problem of active immunity against diphtheria is that of the Schick test. Many are of the opinion that at least in the young, this test is not necessary before the use of the toxin-antitoxin mixture, believing that it is safest to administer the prophylactic to all from six months to young adult age. We are inclined to favor the premliniary test, and believe it should certainly be performed on all above six years of age, but, whether this be employed or not, it is essential that a test be made at an appropriate time after the attempt to establish immunity. Obviously, if the necessity of this step is accepted, it is most important that the potency and uniformity of the material used be assured as far as possible. It is true that the Public Health Service takes great precaution to see that standardization is as effective as possible, but no agency can follow the Schick test material from the laboratory of the manufacturer to its final administration to the subject. In our opinion, the performance of the test in as large groups as possible is one of the most certain means of detecting variation in the potency of the toxin-antitoxin mixture, each group thus containing an adequate series of controls.

The vexing question of the carrier is continually cropping up in connection with diphtheria. The wide spread application of active immunization, the judicious use of virulence tests and frequent bacteriological examinations are all measures which have a significant bearing upon this complex problem. The fairly common occurrence of diphtheria bacilli or diphtheriod organisms in nasal discharges, the exudate from mastoid wounds and in material from other sources not ordinarily associated in our minds with this infection, too often, by their serious consequences or by causing unnecessary anxiety or inconvenience, demonstrate how much may be lost by neglect of the procedures just referred to. The advent of toxin-antitoxin prepared from goat serum marks a distinct improvement in the situation, inasmuch as it will make possible the safe immunization of those who may be sensitive to horse serum, and will eliminate the danger of sensitizing many to horse serum who might, subsequently, require serum for some other disease.

Measles, so often referred to as "just measles", but looked upon by the physician as one of the most dreaded of the diseases of childhood, seems in a fair way to be deprived of some of its alarming features. The work of Degkwitz,[3] of Germany, a work which he has carried on in this country following his original researches abroad, seems to have developed many points of interest and value. The work is most suggestive in regard to the identification of the etiological virus, which he believes grows in symbiosis with certain forms of streptococci, in which he includes the type held by Tunnecliff, to be the organism of measles. He holds, with Hektoen, that the virus is filterable and present in the blood and that by special cultural methods it may be propagated and its potency to produce measles may be demonstrated, after many generations, by injection into humans and monkeys. It is striking to note that the blood of monkeys which have not been injected does not protect, while that of monkeys which have been injected with the virus does protect human subjects from infection. His work has revived and encouraged the idea, first developed in the 18th century, that blood from convalescents will protect susceptibles from infection and it would appear

from the experience of a number of men that 20 c.c. of whole blood, even from one who has had measles many years before, if injected intramuscularly and sufficiently early, will protect against or modify the results of infection. Our experience has been extremely limited, but is distinctly in line with the belief expressed above, and which is strongly favored by some who have had opportunity to observe a considerable number of attempts at prophylaxis.

The results which apparently deserve to be classed as favorable are obtained from administration of immune blood between the sixth and ninth days after exposure. The blood of the mother is generally safest from the standpoint of possible specific infection and generally represents immune blood. The drawing of 20 c.c. to 30 c.c. of blood from the vein and its injection in the buttock may readily be accomplished by one who has had experience in such work.

Efforts are being made now to produce an immune serum which will be available for treatment of the established case, but to date the progress has not been encouraging. In a patient suffering from a severe attack of measles, the use of transfusion from an immune donor may logically be employed, though, if presumed to be helpful, an analysis of the special factors to which benefit might be attributed would be difficult.

The remarkable work which has recently been carried out in the study of scarlet fever is of special interest, not merely from a scientific standpoint, but particularly because of the promising outlook in the management of the disease. The demonstration of the relation of the streptococcus haemolyticus to scarlet fever has led to intensive study of the whole group of streptococci, with the development of many new facts and theories which will almost certainly prove to be of inestimable value in connection with other conditions. The recognition of the essentially toxic nature of scarlet fever, so often hinted at by the observation of many points of similarity with diphtheria,—and on several occasions suspected, only to be forgotten when attempts to put the idea to practical use did not fulfil expectations,—has been most significant. The Schultz Charlton blanching test was probably the most important single factor in breaking the deadlock in the study of this disease and has acquired a real value both in diagnosis and in the determination of the suitability of a given antitoxin to an individual patient.

The Dick test, we believe, has also earned an important place in the study of scarlet fever, and in controlling the disease. What we stated with regard to the Schick test in connection with diphtheria, we would repeat with regard to the Dick test, particularly emphasizing the additional assurance of safety by the arrangement of subjects for the test in groups, for the purpose of including controls in each series. It has recently been graphically demonstrated that only concentrated toxin should be kept in storage and that dilutions should be made at frequent intervals if uniformity is to be expected, or at least this plan should be followed until a uniform potency of diluted material, within the fixed time limit and under market conditions can be assured. Our conviction that the Dick test is of practical value is based upon our experience that we have never seen a case of scarlet fever in one who has been clearly demonstrated to be Dick negative, our observations having included many nurses tested and later sent on duty to the scarlet fever wards. On the other hand, we have seen numerous individuals, demonstrated to be Dick positive, who have contracted the disease or who, being positive at its onset, have become Dick negative as the disease progressed. It is emphasized that we have used the expression "clearly demonstrated to be Dick negative" and our reason for this is made plain by reference to a series of comparative tests carried out following atypical group response (P. H. and Commercial—dilute see Table I). Although there is much discussion as to the nature of reactions, such as the Schick and Dick tests, we cannot avoid the belief that for practical purposes they are tests of susceptibility or immunity with relation to specific diseases.

TABLE I.

COMPARATIVE DICK TESTS WITH FRESHLY PREPARED AND COMMERCIAL DILUTED TOXIN.

Tests Made in January, 1928.

Freshly Diluted Toxin from U. S. P. H. Service.				
Number tested	U. S. P. H.— Freshly diluted		Commercial— Ready diluted	
93	Positive	24	Positive	9
	Negative	69	Negative	82
Negative with U. S. P. H. and positive with commercial dilute				1
House staff Dick negative individuals with commercial dilute, developing typical scarlet fever				3
Cases of scarlet fever in Dick negative individuals (U. S. P. H. Toxin)				0

The above group of 93 entirely nurses. Relatively small number of positives explained by fact that many had previously been given immunizing toxin or vaccine.

Artificial immunity has been attempted by three methods: (a) antitoxin, (b) vaccine, and (c) toxin. As for the use of antitoxin for this purpose, we are opposed to it, except in a very few instances. The protection afforded is of such uncertain and, most likely, of such brief duration, that its use can only lead either to a false sense of security, to be followed by disillusionment with the appearance of scarlet fever when the brief immunity has disappeared, or to interference with the production of really effective active immunity.

An example of a possibly justifiable exception to this rule against the prophylactic use of the serum is the case of a woman who, almost daily expecting to be delivered, had for a number of days assisted in nursing her husband during an attack of angina which, only at a late stage, was recognized as scarlet fever. The expectant mother was shown to be susceptible by the Dick test and her presence in a hospital obstetrical ward was pointedly stated to be undesirable. We felt that inasmuch as she must be delivered, to all intents and purposes, in a scarlet fever ward, it was proper to use every means to establish and maintain immunity even though for only a few days. Of course the fact that the delivery was accomplished with no bad effects does not prove that the antitoxin saved the life of the mother, but it must be admitted that the patient was in most precarious position.

Although, for some time we used the ricinoleated vaccine of Larsen, we have come to the conclusion that the percentage of successful immunizations in susceptibles is not as great as with a sufficient amount of toxin.

We have, therefore, returned to the use of the toxin injections for the establishment of active immunity, giving injections in graded amounts, the total being about 95,000 skin test doses ranging from 500 to 60,000 skd per injection. The therapeutic application of the antitoxin is the subject of wide difference of opinion. The rash extinction test and the presence of the rash which is blanched, the response to the Dick test with material prepared from what appears to be a specific strain of streptococcus, the graphic demonstration of the power of the antitoxic serum to neutralize this toxic substance, and the whole clinical picture as represented by serum treated and untreated cases, seem to be sufficient evidence that we are dealing with no less clearly toxic conditions and antitoxic substances than in the case of diphtheria. Whether, in the Dochez type of serum we have an additional bactericidal property, seems not quite so clear, but it is well to bear the possibility constantly in mind in those conditions in which actual bacterial invasion of tissues near to or remote from the original focus of infection may take place. In April,[4] 1926, we reported our analysis of a number of cases of severe type to whom serum was given, and expressed the opinion that they were materially benefited in respect to general condition. Moreover, there was a definite shortening of the period of fever. But, of chief importance, there was a considerable lessening of the frequency of serious complications. Few patients die of scarlet fever: those who die following the onset of this disease do so from the effect of the complications. One of our chief concerns, then, while we recognize as of immense benefit any measure which will alleviate the distressing early acute symptoms, is with the hope that this early evidence of the efficiency of antitoxin in reducing the frequency of complications will—by further studies—measure up to expectations. A preliminary survey of the series of patients treated and untreated during the present series indicates that our earlier impressions of the favorable effect of the antitoxin will be confirmed.

In our former report we urged the advisability of using large doses of serum at as early a date as possible to insure the complete binding of the toxic substances by the antitoxin before the former should become fixed in the tissues. We would emphasize this point again, for we believe much of the prejudice against the use of antitoxin is due to inadequate and too late injection. Much discussion has arisen about the frequent occurrence of urticaria, and we have found the condition frequently annoying. It would be unfortunate if this circumstance, which is by no means confined to the use of this particular preparation, should be allowed to obscure a real and compensating benefit. In the occurrence of this distressing condition there would seem to be rather an additional argument in favor of the establishment of active immunity than the appropriate

use of passive methods. Much attention is being given to the problem of the various forms of "serum reactions or serum sickness" both from the standpoint of prevention and treatment. As regards the first phase, special consideration is directed toward comparisons of products of different manufacturers, and of different lots of the product of the same manufacturer, while the mainstay of treatment seems to be adrenalin. Ephedrin and lately ephedrin with calcium have been used, though, as far as we have been able to determine, there is little evidence that these preparations are definitely more effective than adrenalin. It is our plan to study these more intensively during the next season if the need for them is apparent.

We would also urge the precaution of testing for sensitiveness to horse serum by injection of a small amount of the antitoxic serum in the skin before administration of the therapeutic dose, and of having on hand adrenalin solution for immediate use in case of need.

We cannot leave the discussion of this disease without reference to the matter of quarantine and to urge the study of the bacteriology of discharges and of the throat in every instance in which special local lesions may suggest the necessity of unusually prolonged confinement. We do not believe we can justify the discharge of patients who almost certainly carry with them active specific streptococci and, at the same time, confinement of others because of the gross evidence of a discharging sinus, the contents of which may readily be shown by repeated cultures to be entirely without specific relationship to the disease.

We have become rather accustomed to the idea that epidemic meningitis has been brought under much better control since the advent of the Flexner serum, and the evidence amply justifies that belief. But, observations in a number of cases about a year ago brought clearly to our attention the fact that situations may arise in connection with the disease in which more than the mere administration of serum as it comes to us from the market may be required. Several cases occurred, notably in Italians, in which there was an apparent rapid improvement, to be followed by a prolonged downward course of a number of weeks, ending in death. In our efforts to relieve these patients, several special considerations presented themselves and led to special investigations, particularly in connection with one of this group. First, we became more and more impressed with the fact, as indicated by tables representing agglutinating tests made by the Public Health Service, that we were dealing with a strain of meningococcus, not falling sharply within the accustomed groups or types and, therefore, quite likely to be not definitely amenable to the antibactericidal effects of the sera at hand. On the basis of this study, we sought specimens of serum which, when directly tested against the organism obtained, might seem to be the most effective. In our search, the blood of the patient himself and that of a subject believed to have had epidemic meningitis some years before, were titrated and the preparation of vaccines and specific serum by injection into rabbits was undertaken. Our efforts were not successful so far as this case was concerned, but we are firmly convinced of the importance of early studies of the relation of the serum being used in a given case to the specific organism and the early production of autogenous materials from the specific organism when either laboratory or clinical data indicate that the early results have not been favorable or that the prognosis is not satisfactory, as based on daily observation.

In our consideration of meningitis, we are apt to forget that even in the epidemic form the infection is certainly in a large percentage of instances, and probably in many more, a blood stream infection as well as an infection of the central nervous system. With this fact in mind, it is our regular custom to give early intravenous injections of serum in every case. The employment of lumbar puncture and the administration of serum by the lumbar route is universally recognized. A great deal of discussion has recently centered in the matter of cisterna puncture in the treatment of meningeal infections, and the evidence is clear that in cases of block this procedure may prove life saving and should invariably be used. There is also a growing conviction on the part of many that this procedure is indicated as a routine method of introducing serum most effectively to all parts of the meningeal covering of the brain, and particularly of reaching the basilar regions. The work of Ayer and others tends to develop considerable doubt as to the extent of distribution and the concentration of serum in the cerebral area when

given by lumbar puncture alone. It is imperative that cisterna puncture be available under the special conditions indicated and it is certainly advisable in those conditions in which satisfactory progress is not being made, a situation possibly due to unsatisfactory drainage, the inadequate local application of serum, or the necessity of using serum of low potency against the organism with which we may happen to be dealing.

We have assumed in this discussion that the diagnosis of the epidemic form of meningitis has been established. The difficulties of differentiating between this and other acute forms of central nervous disease infection may, however, be very great. The organism is not always abundantly intracellular; other organisms, notably the streptococcus, in smears or early cultures, may closely resemble specific diplococcus. The gonococcus, rare as it may be in this class of disease, may be distinguishable only by careful agglutination tests. The entire absence of organism and the characteristic cellular picture in the fluid is the not uncommon finding upon which the need for specific serum treatment may be based. The fact that there is available a form of therapy particularly appropriate to the epidemic infection must not obscure the fact that the pneumococcus and, rarely, probably other bacterial invasions, have yielded to persistent drainage of the cerebrospinal canal and the application of suitable measures for the clearing up of local lesions which may be the source of the invasion. That patients suffering from these infections are imperatively hospital patients, goes almost without saying.

In none of the infectious diseases is there more reason for our interest at this time than in the group designated by the name encephalitis, or poliomyelitis, or by a combination of these. Dr. Flexner, in his Kober lecture for 1928 at Georgetown University, emphasized the fact that it is more than barely possible that we may be faced with an epidemic of serious proportions in the near future. Nothing could be more inspiring than the work which has been undertaken under Dr. Flexner's guidance in the study of this disease, even though, unfortunately, much is left to be desired in the way of answer to the problems involved. But certain facts of importance have been developed, which should be kept clearly in mind in the management of our patients.

The main reliance must, at this time, be general measures, the judicious use of spinal and cisterna puncture both for diagnosis and treatment, and the use of convalescent or immune sera. Dr. Flexner pointed out that there is a very strong indication that animal sera prepared today as antipoliomyelitic or antiencephalitic are not only not specific but that their use may distinctly unfavorably influence the course of the disease. With recovered human patients, then, as the one source of supply, and probably our one specific therapeutic agent, the necessity is evident of discovery and registration of possible donors, of the proper study of their blood to make sure of its purity for injection, and of provision for securing, storing and distributing blood so that the maximum degree of specificity and its most appropriate allotment may be reasonably assured. A further caution is in regard to the method of administration, it being emphasized that whether or not intramuscular or intravenous injections be given, it is essential that the serum be given intraspinally, inasmuch as it is well established that substances introduced into the tissues or blood stream are not passed to the cerebrospinal fluid, at least in concentration sufficient to be effective in the treatment of the conditions under discussion.

In conclusion, we will just mention briefly our third reason for bringing before you this often repeated subject of the infectious diseases a reason which we have intended to imply in what we have already said, namely, our belief in the opportunity and the responsibility in connection with these cases which concerns every physician. We believe that the prophylactic measures which have been developed and which are being perfected should be the object of persistent and consistent individual and public campaigns.

Sanitary laws, established for the purpose of controlling and eradicating epidemic diseases, can only be the expression of the thought of those who are enabled by training and practice to know their value, and the efficiency of these laws or customs in producing practical results will always be in proportion to the zeal with which they are advocated and urged in accordance with honest conviction of the medical profession. The individual physician in

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his daily rounds has the privilege, which entails the obligation, to make the most direct appeal to the public, whose doubt and prejudice he may frequently explain away by a brief discussion of the principles in which he himself believes.

When it has been clearly demonstrated that diphtheria can practically be eliminated from a community, it behooves every community to bend every effort to duplicate that accomplishment. The promise of a similar result in scarlet fever should be carefully and seriously studied so that the desired end may be reached sooner by the co-operation of all concerned, rather than hindered by indifference or hasty adverse conclusion. The success which has attended the efforts at control of some of the diseases in the past should be accepted as adequate grounds for hope of even greater achievement in the future. Upon our diligent observation of the clinical and laboratory data and our readiness to co-operate with each other may depend the orderly and efficient conduct of measures which may prevent, or control epidemics of meningitis or diseases of the encephalomyelitis groups, and upon our diligent and logical simultaneous employment of nonspecific therapy may depend the success of the specific agents which have been proved to be of value or whose value it is hoped will be demonstrated.

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1801 *I Street, Northwest.*

THE UROLOGIC PROBLEMS OF CHILDHOOD.*

By A. I. DODSON, M. D., Richmond, Va.

The growing recognition of the importance of thorough urologic studies in childhood is responsible for great progress in the diagnosis and scientific treatment of these conditions in recent years.

The studies of Bugby and Wollstein ("Surgical Pathology of the Urinary Tract in Infants," *J. A. M. A.*, December 31, 1924) shed a great deal of light on the problem of genito-urinary diseases in children. Bugby and Wollstein made a study of the post-mortem reports of 4,903 cases at the Babies' Hospital in New York, and they found that 117 of these patients suffered from lesions of the kidneys. By far the largest percentage of these lesions were the result of obstruction, there being forty-four cases of hydronephrosis, in most of which there were either congenital valves or strictures at the ureteral or bladder orifice or congenital hypertrophy of the verumontanum. They found stones to be present in thirteen cases and pyonephrosis in nine. These patients varied in age from six hours to five years. These findings point out the tremendous importance of studying these little patients for the possibility of urinary tract disturbances, many of which are amenable to treatment by properly directed methods.

Lowsley and Butterfield ("Urologic Conditions Among Children," *Journal of Urology*, December, 1925) discussed the subject at length and reported 100 cases coming under observation at the New York Hospital. They found that thirty-seven of these patients came complaining of incontinence of urine, chiefly nocturnal; that twenty-nine complained of congenital anomalies, with thirteen cases of renal infection, four of which were tuberculous; there were four cases of vaginitis; three of stricture of the ureter; two perinephritic abscess; two calculus; one nephritis; one lues, and one venereal warts. There were seven cases in whom no pathology could be found. These patients complained chiefly of pain and frequency of urination and cleared up very promptly on forced fluids and alkalinization of urine. They varied in age from eleven months to sixteen years, the average age being eight years. There were two patients suffering from congenital malformation of the posterior urethra and two with stenosis of the meatus. Here, again, we notice a propensity to congenital defects.

Abraham Hyman ("Clinical Aspects of Surgical Disease of the Urinary Tract in Children," *Journal of Urology*, October, 1926) reports 150 cases, 62% of which are due to lesions of the upper urinary tract. Of this number, there were ten suffering with hydronephrosis, ten with tuberculosis, seven with pyelonephri-

*From the Department of Urology, St. Elizabeth's Hospital, Richmond, Va.

tis, twenty-one pyelitis, twelve with neoplasms. There were six perinephritic abscesses. Included in forty-eight diseases of the lower urinary tract were twenty-eight instances of chronic retention of urine. The causes of this retention were contracture of the neck of the bladder, diverticula of the bladder, congenital valves of posterior urethra, etc.

It will be noted from the above figures that the genito-urinary diseases usually met with in children differ from those found in adult life in the increased frequency of congenital defects and of enuresis, and in the absence of diseases incident to advancing years, such as carcinoma and hypertrophy of the prostate. Congenital defect or malformation of the genito-urinary tract is of relatively frequent occurrence and always deserves careful consideration. The most frequent malformations seen in the upper urinary tract in adult life are double ureters, horse-shoe kidneys and, occasionally, congenital absence of one kidney. Careful study of autopsy material in infants has shown that there are numerous instances of congenital stricture, valve formation in the posterior urethra or lower ureter, contracture of the neck of the bladder, and hypertrophy of the verumontanum. These lesions set up marked urinary disturbances early in life, causing back pressure probably before and certainly immediately following birth, and are usually fatal in young childhood unless discovered and corrected.

The first discovery and treatment of congenital valves of the posterior urethra in children was at the Brady Urological Clinic in 1912. Several such cases have been treated with complete relief of the urinary obstruction and back pressure. Several other observers have since reported such cases. When it is remembered that a large number of small children suffer with gastro-intestinal disturbances, pain, gas and indigestion, and that these symptoms are frequently caused by disturbances of the urinary tract, it would be well in such patients, and in those who are anemic and fail to make proper gains, to be more diligent in our search for possible trouble in the kidneys and urinary channels.

The principal defects of the lower genito-urinary tract are undescended testicles, which most frequently result from contraction of the fascial bands surrounding the venous plexus of the testicle and epididymis. At operation it will be found that when the fascia and bands of adhesions are dissected away, completely freeing the veins, there will be no trouble in bringing the testicle down to its normal location.

Hypospadias, a malformation of the urethra in which it opens on the under surface of the penis short of its normal location, is easily relieved by plastic operation. This operation should be done preferably after the fourth and before the twelfth year of life. Epispadias, a much rarer deformity in which the urethra opens on the upper surface of the penis, can be treated very much in the same way. Epispadias, however, is frequently accompanied by defect in the bladder sphincter, with incontinence of urine. Operations for tightening the sphincter have been performed and many successful cures are reported.

Stenosis of the meatus is a fairly frequent anomaly and is occasionally so tight as to produce actual back pressure. The operation for relieving this condition is very simple, and in every instance where the meatus is sufficiently small to produce painful or prolonged urination, the condition should be relieved. Hydroceles and cysts of the cord are occasionally seen in children and should be treated as in adult life.

The majority of children complaining of nocturnal enuresis can be cured by proper home training. There remains a small number in which the condition seems pathological. Search should be made for any congenital defect or malformation in these cases. Occasionally there is subnormal development in the bladder sphincter, or adhesions about the prepuce, or stenosis of the meatus in the male may be causative factors. If no such defects are present, the instillation of irritating substances into the posterior urethra will frequently bring relief.

One of the most troublesome diseases found in childhood and the most amenable to treatment is pyuria. Pus in the urine may result, as in the adult, from infection anywhere along the entire urinary tract. There is a tendency to designate and treat all cases of pus in the urine as pyelitis, forgetting the urethra, bladder and ureters as possible and frequent locations of the disease. Urethritis is occasionally met with both in the male and female child,

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and may be due to the staphylococcus, to a diphtheroid type of bacillus, or to the gonococcus. Simple urethritis is more frequently seen in children with poor hygienic surroundings, and improvement in the child's general health, plus thorough cleanliness, usually is sufficient to clear up the disease. Children not infrequently contract gonorrheal infection from older relatives or from servants, and require about the same treatment as adults. Cystitis in children is probably much more frequently seen than true pyelitis. Investigators have shown that only about 50% of pronounced infections of the bladder also involve the upper urinary tract. Pyelitis in children may be an ascending infection or may result from infection from the blood stream. It is found that girls are much more prone to pyelitis than boys, while the disease is many times more fatal in boys than in girls. This is probably due to the fact that girls are much more subject to the ascending type of infection, which is usually colon in character and much milder than the type of pyelitis which is contracted through the blood stream and is more frequently due to some type of coccus.

Tuberculosis of the genito-urinary tract is frequently met with in children, and careful study should be made in patients complaining of painful urination over long periods of time. Stones are also much more frequent in the urinary tract of children than was formerly thought. Many attacks of abdominal colic and many persistently fretful and crying babies have calculi.

In discussing the treatment of urinary tract infection, it is well to recall that there are two factors which prevent a rapid improvement and cure of these cases—foci of infection in other parts of the body, and faulty drainage of the urinary tract. These two factors probably also are the principal causes of infection. Patients contracting an infection of the urinary tract and having no long standing and persistent infecting focus, and who have adequate drainage, will clear up under proper elimination, diuresis, and antiseptics taken by mouth. Those who, after following such treatment, do not improve or have frequent remissions, demand careful study for the elimination of the two factors above mentioned. It is to this type of patient that cystoscopy offers most, and the following cases are reported for the purpose of emphasis.

Case Reports.

Case 1. B. P. B., age 2½ years, was seen October 8, 1926, because of the persistence of pus in the urine, general restlessness, underweight, and repeated attacks of fever. The child, born in July, 1924, was under-sized at birth and has always suffered with some diarrhea. She has never been up to normal weight for her age, always slept poorly, a great deal of difficulty was experienced with feeding, and she was generally fretful. The urine was first examined at the age of six months, when it was found loaded with pus. She had apparently suffered for some time with pyelitis. She had always run an irregular temperature; whenever taken, it was either above or below normal. Cultures from the urine at six months of age showed streptococcus and colon bacillus. She was put on the usual medical treatment for pyelitis. At the age of one year she was given about a dozen doses of autogenous vaccine and was later given colon bacillus vaccine with apparently transient improvement. At six months of age she had double otitis media and both drums were punctured twice within six months. When she was about twelve months old her adenoids were removed and several weeks later one drum was again punctured. At eighteen months of age her tonsils and adenoids were removed. The child had never had tonsillitis, but the tonsils were removed with the hope that their removal might have some effect on the infection in the kidneys. During the year following removal of the tonsils, until seen in October, 1926, the child was on general medical treatment for pyelitis, including alternating periods of alkalinizing and acidifying the urine, administration of urotropin and of hexylresorcinol.

Our first examination showed a small, rather undeveloped little girl, about 2½ years old with sallow complexion. Catheterized urine from the bladder contained numerous pus cells. Under ethylene anesthesia, a No. 16 French cystoscope was inserted without difficulty. The bladder mucosa was mildly congested throughout and considerably roughened. Both ureteral orifices were normal in location. The right was rather large and gap-

ing; the left was slightly stenosed. The right ureter was catheterized with a No. 5 catheter without difficulty. Eight c.c. of slightly turbid urine were withdrawn with a syringe. This urine contained from eight to ten pus cells to the high powered field. The kidney pelvis was thoroughly irrigated with ½ of 1% silver nitrate. The catheter was withdrawn and efforts made to pass a similar catheter up the left ureter were unsuccessful. After passing a No. 4 pointed bougie up the left ureter, a No 5 catheter could be passed. There was no residual urine in the left kidney pelvis. A specimen was collected and the pelvis irrigated with ½ of 1% silver nitrate. Specimen from this kidney contained two to three leukocytes to the high powered field. Twenty-four hour cultures showed numerous small gram negative bacilli from both kidneys.

She was again seen on October 22, and bilateral ureteral catheterizations with irrigation of both kidney pelves were carried out. At this time there was no pus from the left kidney, but apparently no improvement in the infection of the right. Both kidney pelves were irrigated with 1% silver nitrate. On November 5, 1926, she reported for observation. A specimen of urine from the bladder was examined and found to contain ten leukocytes to the high powered field. There was very marked improvement in the patient's general health. Her parents reported that she slept better, her appetite was improved, and that her complexion seemed better. On November 18, she again appeared for observation. Examination of urine showed it to be entirely negative. There was an average of about one leukocyte to the low powered field and the patient was symptom-free. In summing up the improvement noted in the baby, the child's parents stated that there was general improvement in her appearance, she had gained weight, her appetite and her disposition had improved, she slept better, there was less odor to the urine, there was much less frequency of urination, and that the diarrhea had disappeared entirely.

The little girl did very well indeed until about the first of February, 1927, when her parents again noted considerable restlessness and irritability, with apparently some increase in the bladder frequency. About a week after the onset of these symptoms one of her ears began to run. On February 8, under ethylene anesthesia, another examination was made. The bladder mucosa was mildly congested. Both ureters were catheterized without difficulty, the right with No. 6 and the left with No. 5. There was no residual urine in the pelvis of the right kidney. There were about 3 c.c. of residual in the pelvis of the left kidney. Specimens from both kidneys were collected. There were no leukocytes in the urine from the right and only an occasional one in the urine from the left. Both kidney pelves were irrigated with 1% silver nitrate. From cystoscopic evidence there appeared to be no return of the urinary infection. It is probable that most of her trouble at this last attack was coming from the ear. Since her last observation, February 8, she has been behaving very much as any normal child of her age, eating well and making satisfactory gains and seems entirely well.

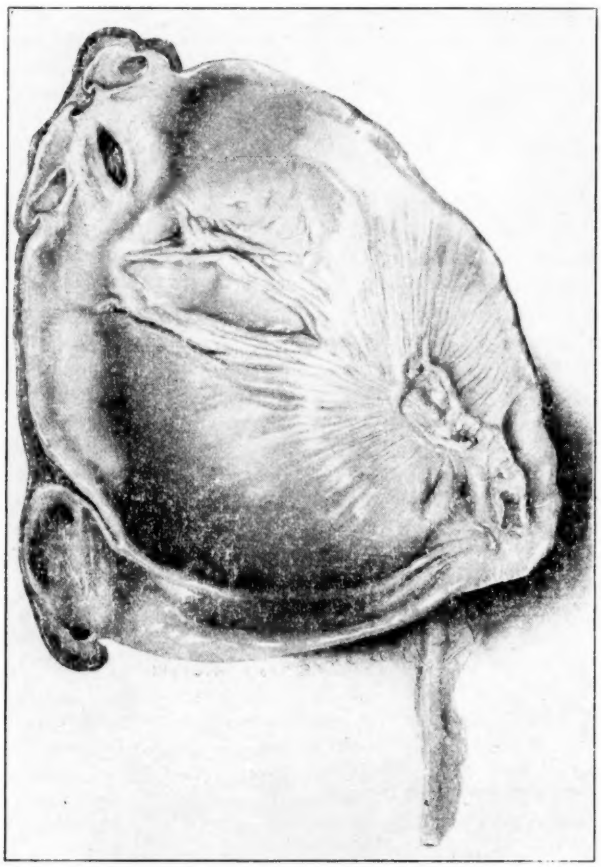
Case 2. Master J. A. C., age 7, was admitted to St. Elizabeth's Hospital May 2, 1926, complaining of a mass in the left side of the abdomen. From the history, the child has always been in normal health and has never suffered any pain or tenderness in the abdomen so far as the parents are aware of. Until the past few months he constantly wet the bed, but this habit has not been noticed for several months. There has been no other disturbance of the bladder. The child's parents state that his abdomen has always been prominent, but it is only within the last few weeks that they have noticed a definite mass in the left side of the abdomen. General physical examination showed a fairly well developed and normal looking child with a definite hard mass filling the entire left side of the abdomen. X-ray examination of the genito-urinary tract showed a normal kidney shadow on the right side. On the left, no kidney shadow could be made out, but there was a large mass which apparently filled the entire side. Cystoscopic examination, May 3, 1926, showed the bladder mucosa normal throughout. Indigo-carmine, given intravenously, appeared in five minutes from the right side. No dye was seen from the left side. The left ureter could not be catheterized. The catheter passed up about an inch and met complete obstruction. The right ureter could be catheterized without difficulty.

Conclusions: Patient has obstruction to the

left ureter, either a congenital valve or a stricture with resulting hydronephrosis of the left kidney. On May 5, 1926, the left hydronephrotic kidney (Figure I), was removed by Dr. J. Shelton Horsley. The patient made an uninterrupted recovery and left the hospital May 25, well.

Case 3. C. W., girl, age 15, entered St. Elizabeth's Hospital April 30, 1924, complaining of pain in the right lower quadrant of the abdomen, at times extending into the right side of the back. She had complained of this pain from time to time ever since she could remember. Occasionally there were exacerbations of severe pain, but usually a dull ache in the right side most of the time. She was thought to have chronic appendicitis and on several occasions her parents had been advised to have her operated upon. Physical examination was negative with the exception of tenderness over the right side of the abdomen and in the right lumbar region.

Cystoscopic examination showed bladder mucosa normal. There were a few leukocytes and occasional red blood cells in the bladder urine. Indigo-carmine appeared from the left kidney in eight minutes and from the right in ten minutes. The right ureter wath catheterized without difficulty and about one and one-half ounces of urine drawn off from the kidney pelvis. This urine contained occasional leukocytes. An X-ray picture of the right kidney was negative for stone. Under the fluoroscope the pelvis was filled with 15% sodium



Shows anterior wall of the left hydro-nephrotic kidney resulting from stricture of the ureter. This kidney was removed from a boy seven years of age.

bromide solution, the catheter having been withdrawn to a point below the prominence of the sacrum. After the pelvis and ureter were filled, an X-ray picture was taken, which showed the ureter and pelvis to be markedly dilated. Most of the dilation in the pelvis was in the calices. There was a filling defect in the pelvis about one inch in diameter. This filling defect was believed to be a uric acid stone. On May 2, 1924, a pyelotomy was done by Dr. J. Shelton Horsley and a stone removed from the right kidney pelvis. The patient made a good recovery from operation. A cystoscopic examination on May 19 showed the bladder mucosa midly congested, a few leukocytes in the bladder urine and no residual urine in the right kidney pelvis. Urine from the right kidney contained a few leukocytes. Pyelogram showed the calices to be markedly dilated and the kidney pelvis well filled with the solution. A slight hydronephrosis and dilatation of the ureter remain.

St. Elizabeth's Hospital.

CONTRACTION OF THE VISUAL FIELDS, DUE TO FOCAL INFECTION.
Report of Two Cases.*

By CLARENCE PORTER JONES, M. D., F. A. C. S.,
Newport News, Va.

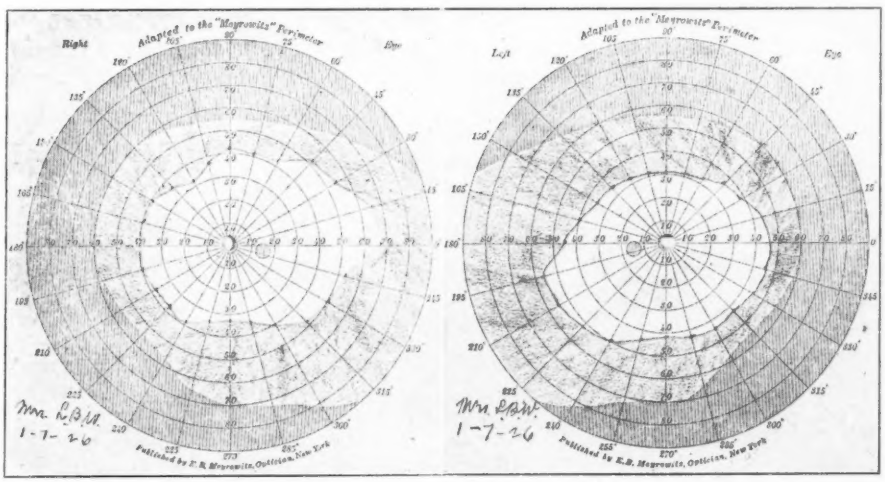
When blindness either partial or complete or contraction of the visual fields occurs, with no retinal pathology demonstrable to eye of the observer, for want of a better name one is apt to say "Toxic Blindness."

Blindness occurring in apparently healthy persons may be toxic. There is a post-bulbar oedema of the optic nerve which may ensue for a number of days before a well defined neuritis becomes fixed. Unless the cause is sought and removed, the natural consequence is total optic nerve atrophy. Scattered cases here and there have occurred in the literature during the past ten or twelve years. As each of you has read them, we will not bother to refer to them here.

As our program is a long one today, I shall report just two cases; each one seems to teach the worth while of the proposition of early intensive study and prompt action.

Mrs. L. B. W.—Age 34 years, came from 30 miles out in the country on January 7, 1926, complaining that she could see clearly only in the front of her, that she had had several accidents and many near accidents while autoing. For the past two days she had suffered temporary blindness for a period of one or two minutes; suffered 3 attacks the day she came.

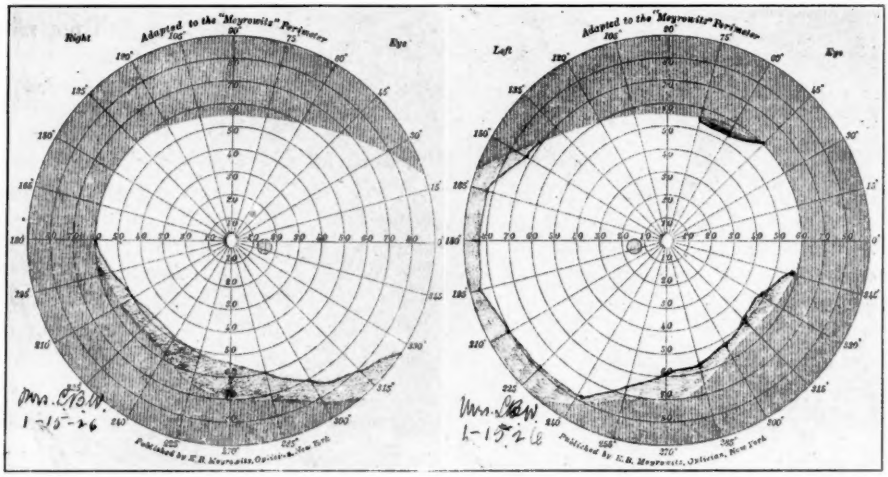
Examination of eyes—vision 20/20 each. Tension 29, McLean. Conjunctiva, cornea and sclera normal in each eye. Ophthalmoscopic examination revealed no pathology. Field of vision contracted in each eye. She was sent



The author submitted other charts, but to conserve space we were compelled to omit the intermediate charts in each case.

*Read before the Virginia Society of Otolaryngology and Ophthalmology.

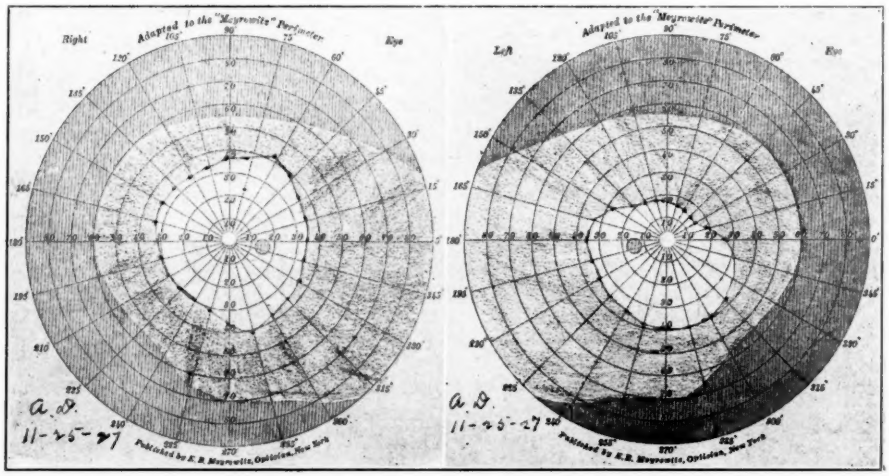
to the Elizabeth Buxton Hospital and put to bed. With the aid of Dr. L. E. Stubbs and others, a very careful and complete physical examination was made, including laboratory and X-Ray studies. She had a negative Wassermann. No pathology could be found except four abscessed teeth and a very minor laceration of the cervix uteri. The nasal sinuses were unusually free from any suspicion of disease. Her tonsils were small and non-



adherent; a culture from depths of crypts revealed a limited number of the staphylococcus albus. On January 13, four teeth were extracted. She refused to be treated for the cervical laceration. On January 15, there was noted a marked improvement in the visual fields. They became normal a few days later and have remained so ever since.

A. D., a negro laborer, aged 42, came to the office on November 25, 1927, complaining that he had had an accident about ten days previously; he walked into a swinging beam which he did not see until he was knocked down by the same. He had had some near accidents, and said that he could not see things at the side of him, and that for a few minutes at a time, occasionally, he was blind, or nearly so.

Examination of eyes—vision 20/100 in each eye. Measure of the fields (using a tiny lamp in place of white disk) showed a contracted



field in each. Tension McLean, 19 mm. each. The ophthalmoscope revealed nothing abnormal.

Throat negative—his tonsils had been thoroughly enucleated. His teeth were examined by a dentist, who reported no pathology.

Nose—in the right chamber was seen an amber colored jelly-like mass hanging from under the middle turbinate body. This mass was pulled away and sent to the laboratory for culture; the report being staphylococcus aureus, pure culture. The left nasal chamber appeared normal. A Wassermann was made which proved to be negative. X-Ray pictures were made which indicated a slight haze in right frontal sinus and right antrum.

On November 29, the right antrum was punctured and irrigated with 25 per cent alcohol in boric acid solution. There was no pus or cloudiness in the return fluid, which was examined in a dead black basin.

November 30, the right eye was blind, left eye vision 20/150. Ophthalmoscopic examination was negative.

December 1, suction drew a yellowish mass from under the middle turbinate, right side. The right frontal sinus was opened intranasally and was found to contain this same material, an amber colored mass which on culture proved to be staphylococcus aureus.

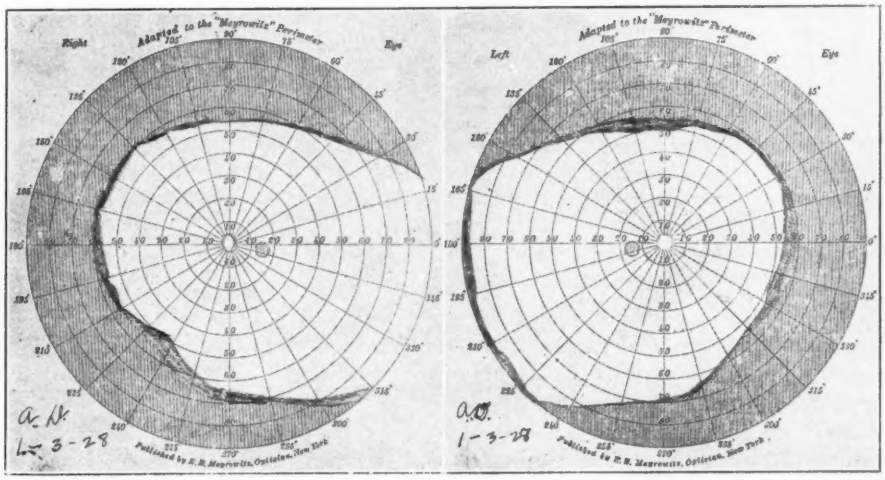
December 3, vision, right eye counts fingers at 3 feet, left eye 20/70.

December 10, vision right eye 20/150, left 20/70.

December 15, an amber colored mass was seen hanging down in the naso-pharynx. The right posterior ethmoids were opened; also a goodly portion of the anterior wall of the right sphenoid sinus was removed. The same amber colored mass was found in each of these locations. Culture of a swab from each yielded staphylococcus aureus.

January 3, 1928, visual fields normal in each eye, vision 20/40 in each.

January 21, vision 20/20 in each eye, visual fields normal in each and he has continued well.



He appeared at the office almost every day during the treatment and his right nasal chamber was tamponed with cotton soaked in hot 25 per cent solution of Solargentum which was allowed to remain in for one hour.

BLOOD SERUM CALCIUM—ITS RELATION TO DISEASE.*

By C. LYDON HARRELL, M. D., Norfolk, Va.

In 1924, Pottenger published a paper in which he recommended calcium chloride intravenously for asthma, hay-fever, urticaria, serum sickness, spasmodic colon and diarrhea. In his asthma cases he claimed his patients were free of attacks from a few months to a year.

Following the publication of this paper many of us began to use the drug. We are always ready to try any thing that will give relief and comfort to the chronic asthmatic

*Read before the Norfolk County Medical Society, March 12, 1928.

even though it be for a short while. I am sorry to say that our results were disappointing and many discarded the drug. I determined to give it a fair trial and have continued its use in asthma and hay-fever. I will add that it only helped to break up the attack; it does not relieve the cause.

Pottenger's idea was that there was some defect in the neurocellular mechanism, due to an imbalance of the potassium and calcium ion, producing a hyperirritability. He believed this to be due to a lowering of the calcium in the system. He treated them regardless. According to his article, he made no attempt to estimate the calicum content of the blood. With this in mind, we had our technician look into the different methods of determining the amount of calcium in the blood. She selected the Tisdall method, and worked with it for six months before we began to record her findings. The normal blood calcium as given by different workers varies from 9—13 mgms. per 100 c.c. of blood serum. Victor Myers, in his laboratory text, gives 9—11 mgms. Charles Mayo, in a lecture on calcium in the Mayo Clinic, gives 10.5 mgms. Greisheimer and Van Winkle studied 55 tuberculous adults. This work was on plasma calcium, and not on serum. The figures ran from 10.9 mgms. to 16.4 mgms. These were the highest estimates I found. Most of the workers consider 10 mgms. per 100 c.c. of serum to be the standard in a normal individual.

We have in our office a list of about four hundred blood calciums done in the past two years. I have tabulated here 346, the diagnosis of which I have been able to trace. In the group on which a positive diagnosis of tuberculosis was made, there were 44. Of this group, 25 had a serum calcium below 10 mgms., and eight of them were below 9 mgms.—about 57 per cent below normal. In the group diagnosed as infection of the upper respiratory tract, there were eighty-eight, thirty-eight of which were below 10 mgms. In the group diagnosed as bronchial asthma, there were twelve; of these, eight had a serum calcium below 10 mgms. Two of these were re-checks. One had had a serum calcium of 9.5 mgms. which rose to 12.6 mgms. on treatment, and the one with 8.4 mgms. rose to 13.9 mgms. by giving calcium chloride intravenously. In the hay-fever group there were five cases. All showed a serum calcium below 10 mgms. except one. In the neurological group there were one hundred and forty. All of the latter were cases of Dr. Redwood's, and will be analyzed in his discussion. There is another group I classified as miscellaneous; there were fifty-four in this group. Only fifteen showed a calcium below 10 mgms. I could find only two cases of hypertension on which I had a serum calcium done; they showed 8.9 mgms. and 9.3 mgms., respectively.

A few of these cases deserve special mention. A white boy, age 14, subject to colds, had not been well all winter, and had an infected antrum, as shown by X-ray. He had a serum calcium of 6.4 mgms. March 23, 1926. He was given Alpine sun lamp treatments twice a week, parathyroid extract, gr. 1/10, Lilly, t.i.d.; also autogenous vaccine for a while. On May 17, 1926, not quite two months later, he was entirely well and had a serum calcium of 22 mgms. This is a very high reading, and may be a mistake, but he remained well.

White boy, age 12, consulted Dr. Land for sore eyes, episcleritis, and was treated for some time, with no improvement. His serum calcium was 8.59 mgms. On October 18, 1927, he was given para-thor-mone, m.-x., Lilly, hypodermically. October 20th, a similar dose was repeated; October 22nd, just four days later, his eyes were much better and his serum calcium had risen to 12 mgms. He was then put on parathyroid ext., gr. 1/20, by mouth t.i.d., and advised to continue it for some time. On February 4, 1928, he came by the office and his serum calcium was found to be 10.3 mgms. He had not taken any parathyroid for over a month. His mother stated that his eyes would occasionally get sore, when she would put him back on the tablets and they would clear up. Dr. Smart reported a case of scleritis, due to blood calcium deficiency. This was cured by calcium therapy in October, 1927.

A white girl of 17 came in complaining of a tired and worn out feeling; her people thought she was developing tuberculosis. The only abnormality I detected was a slightly enlarged thyroid. Her serum calcium was 7.9 mgms. She was given parathyroid ext., gr. 1/10, t.i.d. In three weeks she was feeling much better, had gained three pounds in weight, her calcium had gone up to 9.7 mgms.,

and she was advised to continue the parathyroid.

A white male, age 45, had pleurisy with effusion, thought to be tuberculous. His serum calcium was 5.6 mgms. He was sent to a sanatorium and I lost track of him. I read an abstract of an article a few days ago, where an Italian physician had treated twelve cases of pleurisy with effusion by giving them calcium chloride by mouth. He thought he promoted the absorption of the fluid in five cases. This invites further study.

One case of chronic nephritis had a serum calcium of 6.6 mgms. I have not had any experience with this, but Bandler and Killiam in a recent article state there is an imbalance in uremia between the calcium ion and phosphorous ion. They quoted Marriott and Howlard who stated that the acidosis in nephritis was due to a failure of the kidney to excrete phosphorus. The formed also stated that if the calcium of the blood dropped below 7 mgms. there were muscle spasms and distinct convulsions. Bandler also observed that when the blood calcium dropped, phosphorus increased. The normal inorganic phosphorus of the blood being 3.8 mgms. per 100 c.c. of serum, in one of Bandler's uremic cases it rose to 12 mgms.

In many of the clinics calcium chloride is being used in edema to promote diuresis. It is recommended by Christian in an article in Cecil's recent book, but he does not state how it acted.

Altnow and O'Hare, in a recent article on Atropine and Calcium in Arterial Hypertension, found that the serum calcium in the hypertensive cases was a little lower than that of the normal individual. They studied twelve cases and found the blood calcium ranged from 8.6 mgms. to 10.6 mgms., and gave as a working normal 10.28 mgms. My two cases were 8.9 mgms. and 9.3 mgms., respectively. Altnow and O'Hare were checking up on some work previously reported by Kylin, who stated that he had obtained a normal blood pressure in four individuals with hypertension by oral administration of atropine and calcium chloride. Altnow and O'Hare used atropine and parathyroid extract, and succeeded in bringing the calcium content up to normal, but got only slight lowering of the blood pressure.

Calcium also seems to have a good deal to do with the clotting of blood. It is used quite extensively before surgical operations to lower the clotting and bleeding time, as in tonsillectomy of bleeders, and in gall-bladder diseases accompanied by jaundice. Dentists tell us that the faulty development of teeth in children is due to a deficiency of lime in the pregnant mother or growing child.

There are several ways of raising the calcium content of the blood. A diet rich in calcium is nuts given over a long period of time. The Alpine sun lamp is useful. Calcium lactate in aqueous solution may likewise be given on an empty stomach. The efficaciousness of this has been doubted by some, but Bower and Roper have demonstrated that it can be done. Calcium chloride intravenously is the quickest way of all, but is fraught with danger. It is very irritating to the tissue in case you get out of the vein, and it must be given very slowly and well diluted. It does not have a tendency to accumulate in the system when given in this way, as it is rapidly excreted through the kidney. The safest and probably the most satisfactory methods are para-thor-mone given hypodermically and parathyroid extract by mouth. Give hypodermically, frequent blood calciums should be done. Given by mouth, blood calcium should be done at least once a month.

Much has been written about the therapeutic uses of calcium, but to my mind there is really only one,—that is to raise the calcium content of the blood when it is found deficient. We have found it low in many conditions, as spasmophilia, tetany, asthma, tuberculosis, hayfever, infection of the upper respiratory tract, nephritis—with and without hypertension,—and pleurisy with effusion. Many others may be added as the work goes on.

Tuberculosis	Asthma	Infection of Upper Respiratory Tract	Miscellaneous
9.1	8.9	7.2	11.2
11.	10.	8.2	11
7.9	9.5	9.5	8
8.5	*12.6	6 4	11.2
10.	8.2	9.2	8.9
9.5	13.	9.7	†4.6
10.1	9.9	9.8	11.8
9.9	8.4	6.	11.8
9.29	*13.9	13.9	11
8.7	9.5	10.9	12
10.	9.	9.3	10
10.	8.5	12.	9.1
10	———	9.45	12.2
10.8	12	8.9	10.3
8.85	———	13.1	10.2
11.	Hay-fever	9	10.1
9.5	10.4	10 5	10.7
13.2	8.2	8.85	10.6
9.5	9.2	9.9	10.4

Tuberculosis	Hay-Fever	Infection of Upper Respiratory Tract	Miscellaneous
9.9	9.9	13.3	12 3
10.5	9.9	10.2	10.4
9.7		13 3	6.6
10.8	5	9.2	10.9
10.		9.8	11
1 2	Hypertension	9.2	10.8
9.2	8.9	9.95	11
10.4	9.3	10.5	10.9
11.3		9.9	8.6
11.	2	8.5	10
11.2		9.7	11
9.3		11.	14
9.9		10.	10.5
9.9		9.	15
9.		9.1	9.9
9.2		12.7	9.4
10.1			9.4
8.		9.7	7.9
9.2		11.	9.7
7.6		9.5	12
8.8		13.9	10.3
10.8		10.1	10.5
9.2		10.3	9.6
9.3		9.69	11.2
8.5		12	11.4
		10.6	10
44		9	11.3
		10	10.8
		12	9.2
		10.7	9.9
		11.2	9.6
		12.5	10
		10.2	11.2
		9.9	10
		10	10.3
		10 1	9.5
		10.1	
		9.98	
		13	55
		12.1	
		10.2	
		11.1	
		11.2	
		10.25	
		10	
		13.3	
		9.8	
		9.8	
		12	
		8.59	
		11.	
		10.2	
		13.3	
		11.2	
		11.3	
		9.1	
		11.5	
		10.3	
		8.9	
		*9.84	
		10.4	
		10	
		11.3	
		10.8	
		9.2	
		9.9	
		9.6	
		10	
		11.2	
		10	
		10.3	
		88	

*After treatment.
†A colored man just over pneumonia.

I do not know whether demineralization is a cause or effect of disease, whether the lowering of the calcium content of the blood is due to a dietetic discrepancy or an endocrine disturbance, but we do know that in many instances where the calcium content of the blood is found below normal and it is raised to or above 10 mgms., the patients are relieved of the symptoms of which they complain. The calcium can be raised by feeding parathyroid extract alone. It is pretty well accepted that the parathyroid gland is the calcium regulator of the system, as proven by Collip and others.

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DISCUSSION.

DR. F. H. REDWOOD, *Norfolk:* One hundred and forty calcium determinations have been made on the same number of successive patients who came in for a nervous or mental diagnosis. From this study a number of interesting points have been brought out and possibly one fairly definite conclusion has been reached. At the present time no one has been able to give a satisfactory normal standard for calcium concentration in the blood serum. In our office we take the normal as ranging from ten to twelve milligrams per one hundred cubic centimeters of blood. As we collect a larger number our ideas as to the normal may change from the above figures.

Of forty-seven cases diagnosed as psychoneurosis, eighteen were below normal, the lowest being eight milligrams. On sixteen endocrine cases there were only four that were below, and none of these were below nine.

In connection with the psychoneurotic and endocrine cases, an interesting point was brought out in regard to the blood sugar level, the blood sugars being lower in the psychoneuroses than in the endocrine disturbances. This I would expect to be the other way. In sixteen cases of epilepsy there were seven below normal. In ten cases of hypertension there were four cases below normal, the lowest

being seven milligrams. In two cases of postencephalitic syndromes with tremors, both were deficient in calcium. In seven cases of spasmodic muscular disorders, six were below normal and one was a low normal.

From the above study, no conclusion can be drawn with the possible exception of the muscular conditions. Although there were only a few cases, the determinations were consistently lower than any of the other groups.

DR. FRANK P. SMART, *Norfolk:* My interest in blood-calcium deficiency dates from a case of scleritis which I reported in *The Virginia Medical Monthly* last October. In this case the calcium deficiency was detected in routine examination and was not thought to be connected with the scleritis, but the administration of calcium and parathyroid acted almost as a specific in the primary attack and also in three relapses during the succeeding year.

Another case of interest is that of a lady whose weak spot seemed to have been her ethmoids. She probably carried a slight, very low-grade infection there all the time. She probably became sensitized to the bacterial protein of her ethmoid infection, or there may have been some other cause, but the fact remains that her turbinates swelled rather suddenly one day and her eyes got red and watery. For two weeks we tried every way to shrink her turbinates, but nothing succeeded, even in giving her one breath through the nose. Her blood-calcium was low and Dr. Harrell started an intravenous injection of calcium chloride. By the time half of the dose was injected, her nose suddenly cleared, and in the succeeding six months there has been no recurrence.

Another case is of a young lady on whom I was about to perform an intra-nasal operation. The laboratory reported a clotting-time of more than 35 m nutes She was given one dose of calcium chloride intravenously and 10 units of para-thor-mone intramuscularly and the operation was postponed. Three days later her clotting-time was 3 minutes and the operation was unaccompanied by any undue bleeding.

The last case I will mention is one that is very typical of a large group. Without going into detail, the history was of asthma of ten years' duration, associated with chronic ethmoiditis and polypoid degeneration. For business reasons the ethmoid operation had to be deferred, but as his blood-calcium was low, a calcium regime was instituted and the asthma disappeared almost at once. In fact, the asthma was the thing from which he had sought relief, and to this day I have not been able to get him to have his nose attended to.

I feel that the whole subject of calcium therapy is still largely on an empirical basis; many cases show low blood-calcium, but no symptoms; others show deficiency symptoms in spite of a high blood-calcium. I think that one of the greatest hindrances to progress from an empirical to a scientific basis is inherent in the test itself. The end point of titration is a pink color, which persists for one minute. The relative acuity of color-vision of individuals that are not color-blind, is so variable that the readings by different technicians will vary a great deal. A less vague end-point should be sought. When this is found, we will no longer have one authority sticking to 9 mg. and another to 14 mg., as normal standards.

505 *Medical Art Building.*

SARCOMA OF THE CHOROID.*

By J. N. GREEAR, JR., M. D., Washington, D. C.
Associate Professor of Ophthalmology, Georgetown University, School of Medicine.

The most common malignant intrâ-ocular tumor that the ophthalmologist encounters is sarcoma of the choroid. These sarcomata consist either of round cells or of spindle cells, or a mixture of both. They are usually pigmented, the non-pigmented variety being rare.

The development of sarcoma of the choroid has been divided into four stages:

1. Early stage, which may or may not be accompanied by detachment of the retina or disturbances of vision.

2. Glaucomatous stage, in which the eye usually assumes the appearance of acute congestive or absolute glaucoma.

3. The stage where the tumor has extended beyond the confines of the globe.

4. The development of metastatic nodules in the internal organs, most frequently the liver. Years usually pass before the sarcoma has run its course, although its growth becomes more rapid toward the later stages.

Sarcomata develop from the external layers of the choroid and usually grow inward toward the vitreous space, pushing the retina before them. Where the retina is still in contact with the choroid or tumor mass the diagnosis should be more easily made. However, the retina soon becomes detached due to circulatory disturbances and the retinal detachment becomes very much larger than the area involved by the tumor itself. The intra-ocular tension is of value in determining whether we are dealing with a sarcoma or with a simple serous detachment of the retina, for in the former a normal or increased tension usually prevails, while in the latter a subnormal tension is the rule. Transillumination is one of the most valuable adjuncts we have for differentiating these two conditions, and this will give us fairly accurate information even though the lens has become partially opaque.

de Schweintiz[1] expressed the opinion that the diagnosis of detachment of the retina due to a tumor, although often presenting apparently characteristic features, was not, in certain instances, free from difficulties.

He detailed two cases which presented the appearances usually ascribed to a growth.

*Read by invitation before the Virginia Society of Otolaryngology and Ophthalmology, in Newport News, Va., Spring, 1928.

After enucleation, it was found in the one instance that the elevation of the retina had been caused by an exudation, and not a morbid growth, and in the other by an exudation of round cells, not sarcomatous, but probably due to a chronic inflammatory process.

If the patient comes under observation in the first stage of the disease, the diagnosis should not be difficult, if kept under observation. This does not hold true for the second stage, for at this time the patient presents the symptoms of an acute congestive or absolute glaucoma. A very careful history regarding the vision in the eye prior to the attack and the tension and refraction of the fellow eye, are very important, because in primary glaucoma that has gone to this stage the fellow eye usually shows some evidence of the disease. Localized or undue varicosities of the anterior ciliary vessels may be of value. The iris and anterior segment of the eye should be studied carefully for any evidence of unusual pigmentation.

The type of case in which the media have become opaque and the eye assumes the appearance of an absolute glaucoma is the one in which the diagnosis of sarcoma of the choroid is most difficult. Trans-illumination is of little, if any, value. This is not infrequently the case that presents itself for diagnosis. Sometimes blind eyes are found to contain sarcomata and one occasionally meets with eyes which have been blind and divergent for a very long time becoming affected. Kipp[2] has recorded a case of choroidal sarcoma followed by atrophia bulbi. Twenty years later perforation of the globe and rapid growth of the neoplasm ocurred. Walterhofer[3] reports a case of phthisis bulbi which was found to contain a melanotic sarcoma of the choroid after enucleation. He concluded that the tumor was primary, and the plastic inflammatory processes were either produced by regressive changes in the tumor, or were endogenous, due to local lowered resistance. He suggested that a secondary glaucoma might have developed, followed by a perforating ulcer of the cornea, and phthisis.

Melanotic sarcomata frequently spring from the skin, and in their early and apparently innocent stages are known as moles or pigmented naevi. There have been cases reported in which a monolateral congenital pigmentation formed the predisposition to the development of a melanotic sarcoma of the choroid. Pigmented naevi have been found in the choroid in a few instances.

It is well known that tissues exposed to irritants and chronic inflammatory lesions have a tendency to develop malignancies, and this may have some bearing on the production of sarcomata in blind eyes in which chronic inflammatory conditions persist, and may have been an exciting cause in one of the cases I shall mention later.

Nettleship[4] reported a case of sarcoma of the choroid in an eye affected with gross choroiditis of an early date, this being the essential feature.

Ball[5] says that sarcoma of the choroid may appear as early as the fifteenth or as late as the eighty-fourth year, although it is most frequent between the ages of forty and sixty. Neuro-epithelioma of the retina is found only in children; while sarcoma of the choroid may occur in childhood, such cases are very rare.

The prognosis of sarcoma of the choroid is always grave. While the text-books state that about 40 per cent of the cases operated on in the first and second stages will be saved, it is believed that even a higher percentage of cures would be found to exist if all operated cases were recorded.

Metastases usually make their appearance within a few months after enucleation; however, they may not cause death for a period of five or ten years. Immunity from metastases is considered probable if they have not made their appearance after four years. In untreated cases the duration of life is said to be about five years. The prognosis is more favorable in spindle cell sarcoma than in round cell variety.

Although the prognosis in sarcoma of the choroid is always grave, yet I believe it is much better than in sarcomata, occurring in other regions of the body. This is probably because they are more or less encapsulated in the early stages.

The treatment of choroidal sarcoma is surgery. If the tumor is still confined to the globe, simple enucleation, including a good portion of the nerve, is sufficient. However, if there is any evidence of extension beyond the globe, the orbit should be exenterated, and radium and X-ray applied afterward. Where the growth has broken through into the orbit,

metastases are to be expected. After metastases have taken place, surgery is of no avail except to relieve pain.

Since sarcomata metastasize chiefly through the blood stream, it would seem that where there is no evidence of extension beyond the globe, the post-operative use of radium or X-ray is not indicated. Local recurrences are rare, and radium burns of the skin and permanent loss of the lashes is a common complication.

During the past five years I have had under observation five cases of sarcoma of the choroid, and one reported as arising from the choroid, which I shall report briefly.

Case 1.—I. S., white, female, had been treated as a simple case of refraction for thirteen years. She was seen in August, 1920, at which time there was found to be no change in her refraction from the previous year. In May, 1921, at which time she was 41 years of age, she was again seen, and stated she had been going through the menopause and had been very sick. She had been in bed a great deal, but was much better.

Vision—Right Eye: 20/20+ ws+1.25=c+0.25 60°.

Vision—Left Eye: 20/20 ws+1.25=c+0.37 105°.

She had not complained of any particular disturbance, except her advancing presbyopia, but the routine fundus examination was made. The fundus of the right was found to be normal. The posterior portion of the left fundus was normal, but in the extreme anterior portion of the upper temporal region there was seen a small black protuberance apparently coming off from the anterior portion of the choroid, or from the ciliary body. The diagnosis of sarcoma was made and she was told of the serious outcome if it were allowed to go untreated. Since her vision was still perfectly normal, it was hard for her to see the necessity of such a radical procedure as enucleation, and, before this was advised, it was suggested that she consult other ophthalmologists. She refused consultation and was not seen again until April, 1922. At this time she presented herself with her left eye completely blind and in a state of absolute glaucoma. The tumor had grown very rapidly, and could be plainly seen with oblique illumination filling the upper and temporal portions of the globe. The anterior ciliary vessels were greatly enlarged over this area.

The eye was enucleated and there was no evidence of local extension. Her recovery was uneventful, and she again slipped from under observation. In May, 1926, she died at the age of 46 from a liver condition which we assumed to be a metastasis of the sarcoma (four years following enucleation in the second stage).

Case 2.—S. E. H., age 59, white, female. First seen December 4, 1924. She had been told by an ophthalmologist in another city, seven months previously, that she had a "hemorrhage back of the left eye". She had not seen an ophthalmologist since, and for the past three months she had had flashes of light before the left eye, and the sensation of a veil before it. She had a thyroidectomy and two abdominal operations sixteen years before, but had been well recently.

Examination revealed:

Vision—Right eye: 20/15 with correction.

Vision—Left eye: 20/200 with correction.

The tension was normal to fingers in each eye, and the consensual pupillary reaction was normal. The left pupil reacted sluggishly to direct illumination.

The fundus of the right eye was normal.

The left fundus showed a large mass in the temporal region which projected into the vitreous space. The retina was not detached from the growth, which was very vascular and presented a grayish yellow appearance. There was a small peripheral detachment below, which could be transilluminated while the mass described above could not be. The field of vision of the right eye was normal, while that of the left eye corresponded to the fundus finding.

On December 29, 1924, the left eye was enucleated. There was no evidence of extension beyond the globe, so a fat transplant was done.

The pathological report of Dr. Selinger was as follows:

Eye: Grossly, there is a rather firm dark brown mass about ½ cm. in diameter, which seems to arise from the choroid and extends well out into the vitreous space almost to the midline.

Microscopically: The tumor is completely intra-ocular and is attached to and infiltrates the choroid to a small depth. At this point

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the retina has been completely involved in the new growth and cannot be distinguished. The bulk of the tumor mass is composed of rather large but somewhat irregular spindle cells, many of which have an alveolar arrangement and closely resemble endothelial cells, giving the mass the appearance of an endothelioma. Scattered through the growth are many large coarse deposits of yellowish and brownish black pigment. This is most profuse at the base of the tumor. Diagnosis: Melanotic sarcoma.

She was last seen September 6, 1927, three years following enucleation. She had been operated upon for strangulated hernia in February, and had an abscessed tooth removed for neuritis of her right arm. The left socket was clean and normal in apparance. Right eye was normal and patient was apparently in good condition.

"Examinations of sections made from the eye received on June 9th shows a tumor growth of the melanotic type. Diagnosis, melanotic sarcoma. This section shows what appears to be a growth springing from the lamina suprachoroidea, extending through the sclera. There is no evidence of growth on the inside of the eye and no evidence of any infiltration of the sclera by the tumor. In other words, locally the tumor does not seem to have invaded the other tissues. This is rather characteristic of a sarcoma. The growth is very vascular, the cells being in intimate contact with the blood vessels. There is, therefore, a probability or at least a possibility that metastasis may have taken place by the blood stream.

W. D. Stovall, M. D."

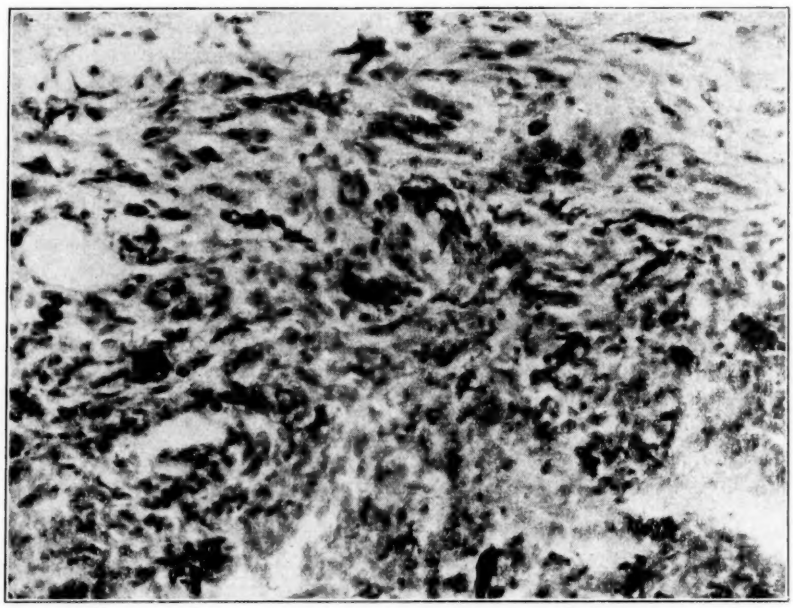

Fig. 1.—Case 4. Microphotograph of spindle cell melanotic sarcoma, showing cellular structure and blood vessels.

Case 3.—R. T., white, female, age 70, first seen by me June 17, 1926. On June 9, 1924, Dr. Eugene Neff, of Madison, Wisconsin, enucleated the right eye, which presented a melanotic sarcoma growing from the sclera outward, but which had apparently arisen from tht lamina suprachoroidea. I have not a complete history of the condition, but the pathological report is as follows:

Radium had been applied to the socket following enucleation which resulted in a loss of the lashes of upper and lower lids toward the temporal half, and there had been some irritation and soreness ever since. She complained of a lump on the right side of her neck which had shown some tendency to grow for the past year. This tumor was removed by Dr. Wm. Marbury who found it to be inflammatory in nature and neither grossly nor microscopically presented any evidence of milignancy. The

right socket was clean and healthy in appearance with no evidence of a local recurrence.

Case 4.—A. D. B., white, female, age 49, first seen July 14, 1925. She complained of the vision of her right eye having been blurred for three months. She had been under the care of another ophthalmologist and had noted no improvement. During this time she had several abscessed teeth removed.

Examination: Right eye vision=20/70 ws+1.0=c+0.50 130°=20/30-2.

Left eye vision=20/20 ws+0.50=c+0.50 60°=20/15.

Fundus: Left eye normal. Right eye media clear. Disc and retinal vessels normal in appearance; between the macula and disc there were a few scattered areas of exudate in the choroid. Above and to the temporal side of the macula there was an area about two disc diameters in width in which the choroid appeared to be thinned out and moth-eaten, although the sclera could not be seen through it. It gave the appearance of a subsiding exudative choroiditis. The retinal vessels passed over this area, and there was no elevation. No hemorrhages were noted. She showed an absolute scotoma corresponding to the larger area described above. She was given a complete medical survey, and found to have two abscessed teeth and infected tonsils. The teeth were removed, but tonsillectomy was refused. She was kept under close observation, and on March 17, 1926, the following findings were noted:

Right eye vision=20/200 ws+1.50=c+0.25 130°=20/40-.

Left eye vision=20/20 ws+0.50=c+0.50 60°=20/15.

Fundus: Right eye shows few recent areas of choroidal exudate in the macula region. Left eye normal.

March 24, 1926.—Tonsillectomy.

May 6, 1926.—Patient complains of very much blurring before right eye.

Right eye vision=20/40 ws+2.25=c+0.25 130°.

Left eye vision=20/15 with correction.

Fundus: Right eye.—The central portion of the area above and to the temporal side of the macula shows an eleveation of three diopters, and is grayish in appearance.

June 22, 1926.—Right eye vision=20/50 ws +3.25=c+0.25 130°.

Area shows seven diopters of elevation in central portion.

December 3, 1926—Right eye vision=20/40 + ws+5.0. Eleveation of mass six diopters. Transillumination shows growth to be very dense, and corresponding to the mass seen with the ophthalmoscope.

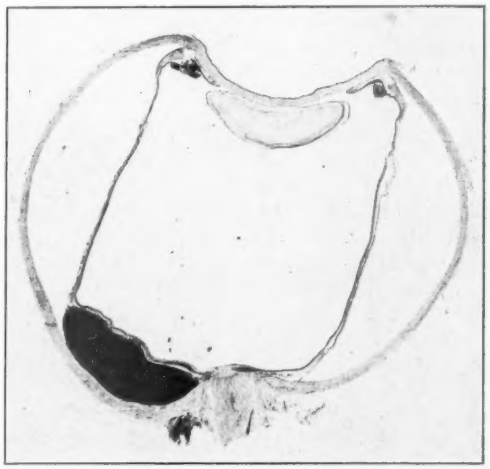

Fig. 2.—Case 4. Photograph showing the flat melanotic sarcoma on one side of the disc. The retina has become detached subsequent to removal.

January 27, 1927.—Right eye vision=20/70 ws+6.0.

Left eye vision= 20/15 with correction.

Tension O. D. 12 (Schiotz tonometer).

Fundus: Left eye normal.

Right eye.—The growth has extended both anteriorly (now measuring 8 diopters) and laterally, encroaching upon the macula and disc, and passing slightly to the temporal side of the macula and above. The retinal vessels pass over the mass without interruption. There is some perivascular thickening of the retinal vessels in this area. The surface of the mass has a rather soft gray appearance with no vascularization being evident.

Diagnosis: Melanotic sarcoma of the choroid.

Enucleation was advised.

I requested that she consult other ophthalmologists. Three men were consulted, all of whom agreed with the diagnosis, and on February 10, 1927, a simple enucleation was performed.

Although there was no evidence of extension into the orbit, radium was applied follow-

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ing enucleation. She received a burn of the lower lid and loss of lashes of upper and lower lids to the temporal side. She was last seen in January, 1928, and was in good condition. "Gross specimen shows: The eye recently left with us by you contained a melanotic sarcoma, largely spindle cell in type, arising from just one side of the disc. It is a flat tumor, 2 to 3 mm. in height and extends over a area roughly a centimeter and a half in diameter. The nerve is apparently not involved.

George R. Callender."

"Microscopical Description: Melanotic spindle-cell sarcoma arising to one side of the disc, does not exceed 2½ mm. in thickness by 1 cm. in diameter. Retina has become detached in the manipulation subsequent to removal, and shows a cystic type of degenerative change. Cornea depressed.

George R. Callender."

Case 5. J. O. H., white, male, age 70, first seen July 23, 1927. He was brought in by his family physician from Edinburg, Virginia. He said that the left eye had been blind for several years, and for the past two weeks it had been very painful. He had been seen by

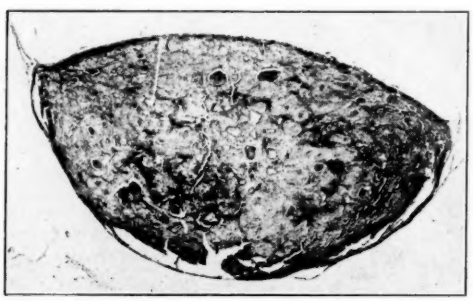

Fig. 3.—Case 5. Photograph of gross specimen showing tumor mass intact.

Dr. Hunter McGuire, of Winchester, in June, 1926, who sent the following report on his findings at that time. "For two years the left eye has been dimming. Large detachment to temporal side of disc. Elevation ten diopters. Black mass of detachment. Transillumination negative. Tension normal. Diagnosis: Melanotic sarcoma. Enucleation advised but patient refused."

Examination: July, 1927.—Right eye vision =20/30+.

Left eye vision=no L. P.

Tension O. D. 20 O. S. 75 (Schiotz tonometer).

Field right eye normal.

Fundus right eye normal.

Left eye presents the picture of an absolute glaucoma. The fundus cannot be seen. Cornea

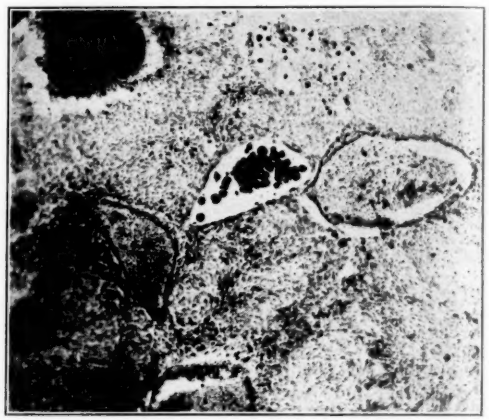

Fig. 4.—Case 5. Microphotograph of tumor showing profuse vascularization and spindle cell structure.

is not peeling off. Iris is plain and regular. No varicosities of globe. Transillumination throws no shadow.

In view of the report from Dr. McGuire and the history, with a normal right eye, the diagnosis of sarcoma of the choroid in the second state was made, and enucleation advised. This was performed on July 25, 1927. There was no evidence of extension of the growth beyond the globe, and on August 22, 1927, the socket was completely healed, and ready for prothesis. The patient was in good condition at this time. The gross specimen showed a large melanotic sarcoma in the posterior part of the globe.

Pathological Report: "Eye tissue.—Section of tumor shows it to be composed chiefly of an embryonic type of connective tissue cell supported by a delicate connective tissue framework. The cells for the most part are irregularly polyhedral shaped of varying size. The nuclei are large irregular and deeply stained. The cells have a tendency to be arranged in atypical alveolar groups. Blood vessels and channels are rather numerous and filled with blood. Scattered throughout the tumor are masses of pigment of varying size. Occasional mitotic figures are seen.

"Diagnosis: Melanotic sarcoma. Spindle cell.

Dr. Maurice Selinger."

Case 6. C. M., colored, female, age 32. First seen June 23, 1924. She gave a history of her right eye having been blind for some months, and stated that it had been inflamed and painful recently.

Examination: Right eye vision nil.

Left eye vision=20/40.

The right eye was soft and atrophic. There was a cyclitic membrane in the papillary space with adhesions between the iris and lens. Because of the right eye being a degenerated and irritable eye, and of the possibility of it exciting sympathetic ophthalmia in the fellow eye, an immediate enucleation was advised.

A simple enucleation was performed under local anaesthesia the following day, and the eye sent to the laboratory for examination. She gave a history of having had anti-luetic treatment, but blood Wassermann was reported negative.

Much to our surprise, the laboratory reported a melanotic sarcoma of the choroid which almost completely filled the vitreous space. She was heard from within the past month and is in perfect health.

Pathological Report: "Tissue: Sections of tumor show a fairly cellular structure composed of irregular spindle and polyhedral cells having large and for the most part deeply staining nuclei, many of which have vacuoles. The entire masses show infiltration with leucocytes and several areas of degeneration are well marked. Mitotic figures are seen. A moderate amount of pigment is seen irregularly scattered throughout the mass.

"Diagnosis: Sarcoma with degeneration.

Dr. Maurice Selinger."

Eyes have been removed for sarcoma of the choroid when they contained only pseudotumors, and the management of cases in which the diagnosis is in doubt has been well summarized by Jackson,[6] who says: "So long as the mass does not increase, watchful waiting is justified, if the eye still retains vision. If the tumor is malignant, early removal is to be recommended. But for a choroidal sarcoma in the first stage, the risk from a few weeks' delay until it shows unmistakable progress is problematic, and scarcely to be weighed against the loss of a useful eye on a doubtful diagnosis. If the affected eye is already hopelessly blind, that is another matter; such an eye should be removed on the mere suspicion of malignancy. But for a seeing eye, true conservatism requires careful observation, with full records of the conditions present, and delay until time makes a more positive diagnosis possible".

In conclusion, I wish to make the following observations:

1. I do not feel that we can be conservative in our treatment of blind, painful and usually disfiguring eyes, although they may not present anything to make the surgeon even suspicious of malignancy. It would be far better to remove hundreds of these eyes without encountering a malignancy, than to allow a single patient to meet death as a result of our conservatism.

2. The importance of routine examination of the fundus is only emphasized by the finding of a sarcoma in its earliest stages in an apparently normal eye.

3. Careful notes on repeated observations of suspicious pigmented deposits in the choroid should be a routine procedure, since they have been found to be the forerunners of sarcomata in some instances.

4. Choroidal sarcoma in its early stages may stimulate an exudative choroiditis, and hence should be considered a possibility in those cases which *do not clear* up under appropriate treatment.

5. It is quite evident that early diagnosis and prompt and radical operation are essential conditions to success in handling these cases.

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1740 *M Street, Northwest.*

"Success is failure turned inside out—
The silver tint of the clouds of doubt,
And you can never tell how close you are,
It may be near when it seems afar;
So stick to the fight when you're hardest hit—
It's when things seem worst that you mustn't quit."

—*Selected.*

MULTIPLE PAPILLOMA OF THE GALL-BLADDER—REPORT OF A CASE ASSOCIATED WITH DUODENAL ULCER.

FRANK HELVESTINE, JR., M. D.,
and
L. G. RICHARDS, M. D.,
Roanoke, Va.

Benign tumors of the gall-bladder are considered to be of rare occurrence by writers of surgical and pathological text-books. Even Ewing, in his monograph on "Neoplastic Diseases," fails to mention the subject. However, in 1914, Irvin and McCarty found one or more papilloma in 85 of 2,168 gall-bladders examined by them, and C. H. Mayo, in 1915, reported 107 cases of papillomatous disease of the gall-bladder found in 2,538 cholecystectomies. Abell, in 1923, reported finding eight benign tumors in 288 gall-bladders examined routinely.

Before these publications, a number of interesting case reports had appeared in the literature. Sutherland, in 1898, reported an adenomyoma, Ringel, in 1899, a papilloma, and Bishop, in 1902, described a benign tumor the size of a child's head arising from the gall-bladder. Mayo Robson described an adenoma in 1905, and Mayer, in 1911, reported the case of a papilliferous tumor occupying the entire gall-bladder.

Papillomata arise from the mucosa of the intestinal tract with comparative frequency, the villous type being most often observed. Irritation leading to overgrowth of surface epithelium, hyperemia and dilatation and elongation of blood vessels give rise to a large series of inflammatory polyps, and these lesions not infrequently pass into true tumors.

The clinical course of a papilloma is usually benign and its growth capacity is usually limited.

Benign tumors of the gall-bladder are usually not suspected before operation. The clinical picture presented is that of cholecystitis and cholelithiasis. Calculi may or may not be associated with the tumor.

The following case of multiple papilloma of the gall-bladder associated with ulcer of the duodenum has recently come under our observation.

Case Report

The patient is a white man, 46 years of age, married, and a cabinet maker by trade. Family history is unimportant. Father died of pneumonia, and mother is alive and in good health. No history of cancer. Past history is also unimportant. The patient has had the usual diseases of childhood. No history of typhoid fever. Had mumps at the age of thirty-nine.

For the past sixteen years the patient has suffered from acid eructations and "heart burn" after the ingestion of certain articles of food, such as tomatoes and cabbage. About two and a half years ago, he began to have attacks of pain and soreness in the epigastrium and right upper quadrant of the abdomen. These attacks at this time occurred every four to six weeks and lasted only for a few hours. The patient did not notice that there was any relation of these attacks to his meals or the ingestion of any particular kind of food. Eating would sometimes relieve pain, but rest seemed to do the most good.

Attacks increased in frequency and severity, first every four or five days, and, finally, the patient suffered almost constantly. If patient worked after meals, attacks would come on in thirty to forty minutes. Pain was accompanied by dizziness and at times the patient would faint. Several times during these attacks the patient was jaundiced. Nausea was pronounced, but vomiting occurred only rarely. The patient did not observe any clay colored or tarry stools, and he was not constipated. In September, 1926, he was forced to quit his work, which he did not resume until January, 1927. He worked until June, 1927, and was admitted to the hospital on July 18, 1927.

On physical examination, the patient appeared to be fairly well nourished and he weighed 146 pounds. Examination of the head and neck showed nothing abnormal. No pathology was found on examination of the chest. The heart was slightly enlarged and the aortic second sound was accentuated. There was marked tenderness and rigidity over the gall-bladder region. There were no palpable masses. Reflexes were normal and the extremities showed nothing of interest. On admission, the pulse rate was 76 to the minute and the temperature was 99° F. Blood pressure was 170 mm. systolic and 82 mm. diastolic. Blood examination showed 85 per cent hemoglobin, and 10,500 leukocytes with 80 per cent polymorphonuclear leukocytes. Examination

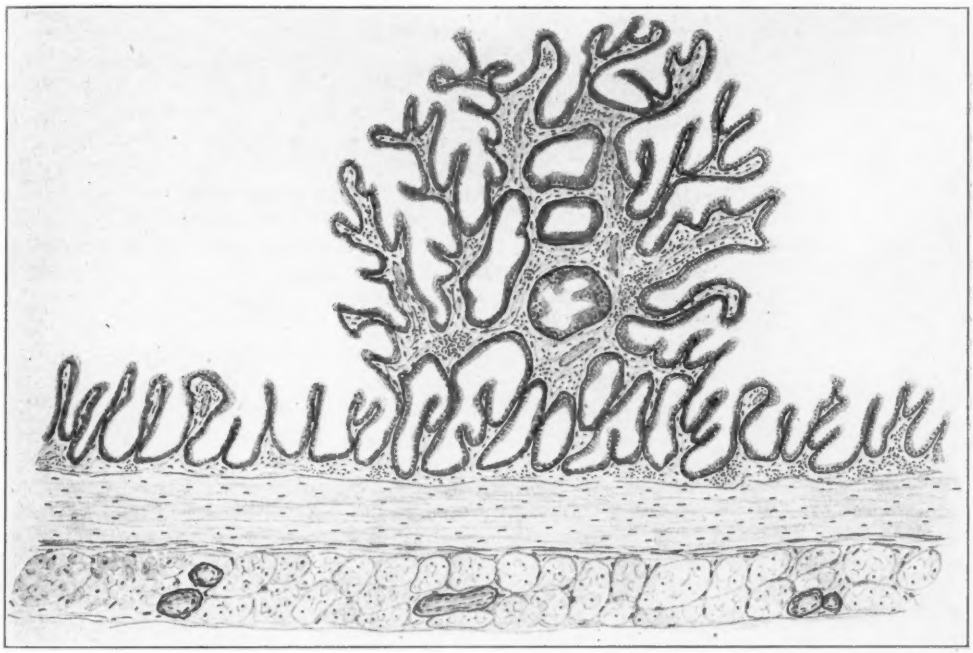
of the urine, with the exception of a slight trace of albumin, showed nothing abnormal.

X-ray examination done previous to admission showed no abnormalities of the gastro-intestinal tract with the exception of a hyperperistalsis of the stomach. Examination of the gall-bladder before ingestion of the dye showed no pathology, but thirteen hours after ingestion of the usual amount of tetraiodophenolphthalein, the gall-bladder failed to fill with the dye.

With a diagnosis of chronic cholecystitis and a tentative diagnosis of gastric ulcer, the patient was operated upon July 19, 1927 (L. G. R.). The abdomen was opened through a high right rectus incision. The wall of the gall-bladder was somewhat thickened and of a slate gray color. There was a white puckered ulcer of the duodenum just distal to the pylorus. The lumen of the intestine did not appear constricted, and there were no adhesions about the gall-bladder or ulcerated duodenum. The appendix was somewhat thickened and kinked at its mid-portion. It was removed in the usual manner. The gall-bladder was removed from above downward and the cystic duct doubly ligated. A drain was inserted down to the stump of the cystic duct and the abdominal incision was closed in layers.

The gall-bladder, upon opening it, was found to contain a quantity of thick bile with much mucus. There were no calculi. Arising from the mucous lining were seven small wart-like excresences, measuring about 3 mm. in diameter. These papillary out-growths were very friable and easily broken from the mucosa. There was no uniformity of distribution of the growths.

Microscopically, it was seen that the mucosa alone was involved in the above described growths. The tumors were composed of branching papillary projections rising above the level of the normal mucosa (Fig. 1). The epithelium covering these villae was of the tall columnar type and had a definite basement membrane. The stroma was made up of a watery connective tissue and was not very cellular. The blood vessels were thin-walled and congested. The stroma was infiltrated by groups of round cells. The entire gall-bladder wall was somewhat thickened and the mucosa especially showed evidences of chronic inflammation.



Microscopic section of papilloma and portion of gall-bladder wall.

Discussion

Braithwaite, in 1923, pointed out the possible relationship between the causation of gastric and duodenal ulcer and inflammatory conditions about the ileocecal angle. Appendicitis has been prominently mentioned by surgeons as an associated condition and as a possible cause of gall-bladder disease. It is interesting to note that, in the case above described, a diseased gall-bladder, a duodenal ulcer and a chronically inflamed appendix were all present.

The relationship of chronic irritation, mechanical, chemical or infectious, to the formation of papillomata has already been mentioned. It is often difficult to determine if these tumors are true neoplasms or inflammatory hyperplasias. The gall-bladder herein described well illustrates the relation between chronic inflammation and the formation of papillomata.

Due to the persistence of the exciting factors, progressive formation of new tumors and malignant changes may take place. The development of malignancy is probably much more frequent than a corresponding change in the growth capacity of the tumor. The gradual formation of a benign papilloma into a malignant neoplasm has been fully demonstrated in the cervix uteri, urinary bladder, larynx, and other locations, and has usually followed the trauma of an incomplete operation or prolonged chronic inflammation.

Summary

1. Benign tumors of the gall-bladder are not as infrequent as the text-books and monographs discussing gall-bladder disease would lead one to believe.

2. The relation between chronic irritation and the formation of papillomatous tumors has been fully demonstrated. Irritation of the mucous membrane gives rise to a large group of inflammatory polyps which not infrequently pass into true neoplasms. By trauma of an incomplete operation or prolonged chronic inflammation, the growths may become malignant.

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Shenandoah Hospital.

TUBERCULOSIS IN CHILDREN.*

By SAMUEL NEWMAN, M. D., Danville, Va.

The subject of tuberculosis in children is so vast and intricate that only its bare skeleton may be outlined here. For the sake of clarity and brevity this will be presented in somewhat dogmatic statements, though I am fully aware of the fact that many of these are still controversial topics in the literature.

Tuberculosis is a disease of childhood. Among 4,003 infants under 2 years of age in two hospitals and clinics in New York city, the incidence of tubercular infection was 11.4 per cent. Chadwick, in Boston, showed that 8 per cent of the underweight children of that community presented evidence of tuberculosis. Levinson, in Chicago, studied 300 children, most of whom had come in contact with tuberculosis. One hundred and forty-one reacted positively to the tuberculin test. Gittings and Donnelly published statistics on the Pirquet reaction, obtained from the records of the Children's Hospital of Philadelphia. Their results demonstrate the high percentage of tuberculous infection in childhood. It will serve no practical purpose to multiply the number of references on this subject. It is now universally recognized that a considerable percentage of all children in the smaller and larger communities react positively to tuberculin tests, which means tubercular infection. In this sense only is the statement to be taken that tuberculosis is a disease of childhood.

Every manifestation of the disease in the adult is merely a development and metastasis of a lymph gland infection during childhood which may lie dormant for a number of years until certain favorable factors present themselves for its activation. These factors are now taught to be grippe, whooping cough, measles, and exudative diathesis. A massive infection with virile tubercular bacilli in the

*Read by invitation at the Tuberculosis Institute for Colored Physicians, Danville, Va., January 26, 1928, and at the meeting of the South Piedmont Medical Society, South Boston, Va., April 17, 1928.

normal adult, or an ordinary infection during a period of temporary loss or lowered immunity in the adult, may also cause the implantation of a new tubercular focus.

The sources of infection are the human and the bovine type of tubercular bacillus. Other types of tubercular bacilli are of no practical importance. The mode of infection for the bovine type is by means of milk through the gastrointestinal tract. The mode of infection for the human type is by (a) contact—kissing, touch, utensils; (b) droplet—direct contact or inhalation.

A sharp division between the type of lesion caused by the human type of tubercular bacillus and that caused by the bovine type is not justified. Munro, of England, reports five cases in which the bovine type of tubercle bacillus was coughed up. Bovine type bacilli have been obtained by him in eight instances from the tracheo-bronchial glands of children who have died from tuberculosis in twenty cases which have been investigated. These bovine bacilli must have traversed the lungs before they reached the tracheo-bronchial glands, and in most instances there was plain evidence at the postmortem that the route of infection was by the abdominal glands.

One of the most helpful conceptions to the understanding of tuberculosis in children was introduced by Franz Hamburger working in the children's clinic at Vienna. The anatomic basis of this conception is the classic work of Albrecht and Ghon, of the Vienna school.

Tuberculosis of infants and children is divided into three stages. *Stage one* consists of the primary focus or the original point of implantation of tubercle bacilli. The focus is practically always in the periphery of the lung. After very careful postmortems on 1,060 tubercular children, Albrecht could find only seven with primary intestinal tuberculosis. Ghon, in 189 cases, could find only three with primary intestinal tuberculosis. A few years ago Ghon and Wertheimer found among 395 necropsies on tuberculous children only six cases with a certain extrapulmonary primary infection (four intestinal, one nose and one middle ear), and three cases in which the primary lesion could not be determined. This primary focus may be very small, almost invisible, or large; may be single or multiple in one lung or in both lungs. As soon as this implantation in the lung tissue occurs, the regional tracheo-bronchial glands become inflamed, enlarged and present the anatomico-pathological and clinical complex known as bronchial glands or hilum tuberculosis.

During infancy the primary focus may extend to the surrounding lung tissue and cause cavitation. In older children the infection is limited to the primary focus plus the regional lymph gland involvement. If the interplay between the infection and the immune powers of the child is favorable to the latter, all that will remain of the tubercular infection will be anatomic signs in the lung and the regional lymph glands. It is also conceivable that a tubercular infection in the primary stage may be healed without even leaving any anatomical traces, leaving, however, a biological trace as manifested in the reaction to tuberculin.

The *second stage* of tuberculosis in children is the generalization of the tubercular process by means of extension of tubercular bacilli through various channels. The multiplicity and polymorphism of the tubercular lesions in childhood are simply determined by the colonization and implantation of tubercular bacilli issuing from the primary focus. This second stage of tuberculosis may manifest itself in children years after the implantation of the primary focus if, for any reason, the immunity which the system had elaborated during the sytemic reaction to the primary focus became lowered.

The younger the child, the greater the tendency for the generalization of the process. Tubercular meningitis and miliary tuberculosis, so common between the ages of 2 and 6, is merely the generalization of the infection by way of the blood stream from the primary focus. The various manifestations of tuberculosis of the skin, mucous membranes, serous membranes, bones, joints, uro-genital apparatus, brain and other organs and parts of the human body take place through the localization in these parts of tubercular bacilli which are carried in the general circulation. What determines the particular localization is unknown. Perhaps the particular point in which the germs localize is a *locus minoris resistentiae*, which, again, does not explain much. Tuberculosis of the lymphatic glands is caused by the extension of bacteria by way of the lymphatics from peripheral foci. For instance, tubercular glands of the neck may have become infected from tubercular bacilli in the

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tonsil. Yet the focus in the tonsil may not necessarily be the primary one. It is possible that the tubercular germs have landed into the trachea and faucial cavity from a broken down primary focus in the lung tissue. Similarly, intestinal tuberculosis with the regional mesenteric gland involvement must not necessarily be caused by a primary focus in the intestines due to the bovine type of tubercular bacillus. Tubercular bacilli from the primary focus in the lungs (whether it be from the focus in the periphery of the lung or from its regional bronchial gland) may, by caseation of the focus and erosion of a small bronchus, be coughed up and swallowed and thus initiate intestinal tuberculosis.

The *third stage* of tuberculosis in children is the chronic pulmonary tuberculosis as we see it in the adult. Only about 1 per cent of all cases of chronic pulmonary tuberculosis occurs in children under 14 years of age. This adult type of tuberculosis, whether it occurs in a child previously known to harbor a tubercular focus or for the first time in the adult, is now taught to take place from a previously existed primary focus in the lungs or the tracheobronchial glands (the primary complex).

We may now tabulate the most common manifestations of tuberculosis in children under the various stages:

STAGE I.

Primary focus, plus regional lymph glands (practically always in the periphery of the lung).
Cavernous phthisis of infancy.

STAGE II.

Bones,	Mucous membranes.
Joints.	Pleurisy.
Peritoneum.	Uro-genital system.
Intestines.	Miliary tbc.
Glands.	Meningitis.
Skin.	

STAGE III.

Chronic pulmonay tbc. of later childhood.
Pulmonary tbc. in the adult.

The avenues or channels through which the tubercle bacilli leave the primary focus to produce the polymorphous lesion of the secondary stage and the lesions of the tertiary stage may be designated, by way of summary, to be:

(a) Hematogenous.
(b) Lymphogenous.
(c) Bronchiogenous.

DIAGNOSIS

I know of no harder problem in the whole range of medicine than the diagnosis of tuberculosis during childhood. In a schematic way, the key to diagnosis may be outlined as follows:

(a) *History:* By this we mean a history of contact with some tubercular member in the family or tubercular stranger living in the family. The younger the child, the more dangerous is contact infection.

(b) *Inspection:* A knowledge of special forms and characteristic localization of secondary manifestations of tuberculosis will aid one to make a diagnosis (tuberculides, phlyctenae, glands, joints, etc.)

(c) *Irregular Prolonged Periods of Fever:* This sign, so valuable in the diagnosis of tuberculosis in the adult, is of lesser importance during childhood. Infants and children, as it is so well known, will show a rise in temperature at the slightest provocation.

(d) *Physical Examination of Chest:* There is a great difference of opinion as to what may be adduced from such an examination. Personally, I am unable to evaluate properly the various highly specialized physical signs described. There are so many conditions in children that will give modified ausculatory and percussory signs over the hilus region that one may be at a loss to know how to interpret the findings.

(e) *Tuberculin Reaction:* In spite of the enormous amount of data on this subject, there is still a great deal of confusion in the minds of many concerning the use, value, and interpretation of a tuberculin reaction. I shall briefly mention the practical accepted notions concerning tuberculin reactions.

The easiest and most commonly used tuberculin test is the Pirquet cutaneous reaction. Two small drops of tuberculin "O. T." (Koch's Old Tuberculin) are placed on the previously cleansed flexor surface of the forearm at a distance of two inches. With a special instrument (the Pirquet borer), a point of the skin in the middle between the two drops is scarified by rotary motion; no blood is drawn by this motion. The same rotary scarification is made in the center of each drop of tuberculin. The central scarification serves as the control. After a few minutes the forearm is dressed with a piece of cotton and adhesive plaster over it. Two days after the result is examined. The central scarification serves as control. An area of reddening, inflammation and indura-

tion of more than ½ cm. in diameter would be considered a positive tuberculin test.

The Mantoux test is an intracutaneous tuberculin reaction. Tuberculin, 0.1 to 1 mg., is injected into the skin of the forearm as in a Schick test. The Mantoux test is more delicate and sensitive than the Pirquet cutaneous test, but it gives a greater percentage of false (traumatic) reactions and may also cause constitutional symptoms. The intradermal (Mantoux) test should be done when the cutaneous (Pirquet) test is negative.

A positive tuberculin reaction during the first two years of life means active tuberculosis. This statement may be accepted without qualification. Later in life a positive tuberculin test means infection which may or may not be active. A negative tuberculin test (except during or immediately after measles, tubercular meningitis, miliary tuberculosis and extreme conditions of cachexia), repeated and verified by the intradermal method, means *no* tubercular infection. There are a great number of conditions in children where a certain negative tuberculin test is of extreme *positive* value.

(f) *X-ray:* It is questionable whether juvenile tuberculosis can be diagnosed without the aid of the roentgenogram. Indeed, the modern knowledge of tuberculosis in childhood could not have been accumulated without the aid of roentgenology. No single method of examination, however, will be sufficient to make a positive diagnosis. All the methods of diagnosis (contact history, inspection, physical examination, observation, tuberculin reaction, X-ray) or a few of them properly interpreted will have to be drawn upon for a proper diagnosis. A few cases may serve as illustration:

Baby G. N., 11 months. Loss of appetite, pallor, chronic cough. Positive Pirquet. Active tuberculosis was diagnosed. At 17 months this baby died with tubercular meningitis.

M. H. E. (991) was first examined nearly 3 years ago when 6 years old. The positive findings then were enuresis nocturna, slightly underweight, mild secondary anemia, infected tonsils. A single Pirquet test was negative. The child was seen recently. Subjective symptoms are practically absent, with the exception of a mild, fleeting elevation of temperature. The child is 11 per cent underweight and slightly anemic. A single Pirquet test was strongly positive (area of induration more than 1 cm. in diameter). On fluoroscopy a minute *primary* focus could definitely be established in the periphery of the right lung. A diagnosis of latent tuberculosis was made. Should the child develop any subjective symptoms, they may rightly be attributed to activity of the primary focus.

G. F. (1389), 2 years and 5 months girl in perfect nutritional condition. The positive findings were suppurating right inguinal glands and painless moderate swelling of the left ankle joint. Pirquet test was positive. X-ray of chest was negative. X-ray of bones also negative. There is no question that the inguinal adenitis and the ankle swelling are to be viewed as secondary or metastatic manifestations of tuberculosis. The child was sent for treatment to the University Hospital and complete recovery was reported, as far as it could be determined.

The value of a positive tuberculin test or of a definite negative one in the presence of enlarged mediastinal glands is conclusive. In the differential diagnosis of various joint conditions, a repeated negative tuberculin test is of great value in excluding tuberculosis.

The treatment of tuberculosis in children may be reduced to a few simple principles. Rest, diet, fresh air and sunshine are the essential things in the treatment. The rest may be absolute or modified, depending on the condition of the case. Sunshine will also include artificial sources, especially in the treatment of localized areas (glands, bones, fistulae, etc.). The essential feature of the dietetic treatment consists in diets rich in protein and fat and poor in carbohydrate. At the Pirquet Clinic, Vienna, the dietetic treatment of juvenile tuberculosis is elaborated into an organized system. The essential features of that system consist in a detailed knowledge of methods of food concentration, the building up of a food tolerance from the theoretic basal requirement up to the maximum that the digestive system will be able to handle without breaking down, and a practical flexible method of quantitative food dosage to suit the manifold clinical situations.

X-ray treatment has a place in the treatment of surface gland tuberculosis and hilum adenopathy. As regards tuberculin treatment, opinions are divided. No less an authority than Czerny, Director of the Children Clinic, Berlin, believes that those tubercular children who do well under tuberculin treatment do so

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in spite of it, not because of it. Czerny uses also daily injections of horse serum in cachectic tubercular children. He believes that the foreign protein stimulates the metabolic processes of the body and an improved state of nutrition results.

I shall conclude with a word concerning the prognosis of tuberculosis in children. The prognosis will be determined, as V. Pirquet stated, by three factors:

(a) Age of the child. The younger the child, the worse the prognosis. The process has a tendency to generalize itself with fatal results.

(b) Location of lesion. Glandular tuberculosis, whether belonging to the primary focus or the result of a metastasization of the primay focus, will offer the best outcome. The outcome of any other secondary manifestation will depend on the extent of its distribution and the nature of the tissue it affects. Thus, miliary and meningeal tuberculosis are invariably fatal. Localization in certain bones or soft organs may have a more favorable issue.

(c) Condition of nutrition. If the condition of nutrition is poor, or if one does not possess the knowledge and technique of raising the nutritional condition of the child, the outcome will be unfavorable.

A new field—which seems to be promising—in the prophylaxis against juvenile tuberculosis has been opened up by Calmette, in France. It is claimed by workers in this field in France and other countries of Europe that it is possible to vaccinate against tuberculosis by the administration of a culture of live bacilli called BCG (bacillus Calmette-Guerin). This organism is of bovine origin and has been attenuated so that it has lost its tuberculogenic properties, but retains its antigenic powers. It finds its greatest usefulness in newly born infants. The vaccine must be fresh. The Pasteur Institute at Paris gratuitously supplies the vaccine to physicians in France. The Greek Red Cross has been vaccinating new-born infants with Calmette's vaccine and thus far brilliant results have been reported from its use. In this country the method of Calmette is being tested out by the New York Board of Health under the close supervision of Park. While it would seem wise to hold in check uncontrolled enthusiasm concerning new therapuetic procedures, it seems probable that Calmette and his co-workers at the Pasteur Institute at Paris have opened up a new era in the eradication of tuberculosis.

OCCIPITO-POSTERIOR POSITION.*

By H. G. MIDDLEKAUFF, M. D., Weyers Cave, Va.

The occipito-posterior position, a subject which is discussed very often because of its importance and common occurrence, demand frequent consideration by all who practice obstetrics. The early recognition of this position and its correction, when necessary, will materially shorten the time and increase the safety of many labors. The frequency of occipito-posterior positions to the total of vertex presentations varies with different series, but it is around 30 per cent in the beginning of labor. The mechanism of occipito-posterior is essentially the same as in the occipito-anterior position except that engagement is very apt to be delayed because the broad part of the head impinges upon the promontory of the sacrum, and in occipito-posterior the occiput has to rotate 135 degrees anteriorly instead of 45 as in occipito-anterior position.

This wide excursion of internal anterior rotation Nature usually accomplishes readily and unassisted, which fact should always be remembered, thereby preventing meddlesome obstetrics. However, in the author's humble opinion, labor should not be allowed to drag on for hours, waiting for Nature to accomplish what the physician can do safely in a few minutes.

Theoretically, the diagnosis of occipito-posterior position is easy, but all will testify to its difficulty in practice, especially in obese women. With the heart sounds heard best low in the flank, but usually sounding far away, with the shoulder felt far back from the midline, and the small parts somewhat anteriorly, and the forehead felt under the opposite pubic ramus, one should strongly suspect an occipito-posterior position. However, the heart sounds may sound unusually loud and on the same side as the forehead, due to marked deflexion of the head, causing the mistaken diagnosis of face or occipito-anterior position. Rectal examination reveals the head high up, the broader diameter of the head and the small fontanel being against the rectum, with the large fontanel either near the center of the pelvis or under the pubic ramus according to the

*Read before the Augusta County Medical Society, at its May, 1928, meeting.

amount of flexion that has taken place. A slow tedius labor with late engagement, with irregular pains both in time and strength, slow descent, and accompanied with the findings given above, should almost make the diagnosis of occipito-posterior position positive. Under the most aseptic precautions, vaginal examination is now indicated. This reveals a slowly dilating cervix, with most of the pressure being exerted on the posterior lip, the head is high up, while the small fontanel is in the posterior half of the pelvis and the large one in the center of the pelvis or under the pubic ramus. The sagittal suture is in either the right or left oblique diameter. A large caput succedaneum is usually there to obscure these findings, in which case search for an ear will have to be resorted to.

A positive diagnosis of occipito-posterior having been made, the prognosis should be considered, while waiting to see if Nature will accomplish anterior rotation. If anterior rotation is arrested or posterior rotation takes place, both mother and child will suffer in several ways unless the child is small or the mother is multiparous, but even then serious trouble may arise. For the mother there await exhaustion and sepsis, severe lacerations, and post-partum hemorrhage from uterine inertia. For the child there await asphyxia and cerebral injury. DeLee thinks that this complication causes more fetal deaths than contracted pelvis. If the occiput seems to be rotating anteriorly with the pains, or is easily pushed in that direction by the examining finger, anterior rotation is to be expected spontaneously when the uterine contractions have become sufficiently powerful.

If the cause of the posterior position is amenable to treatment, this should be treated first, leaving the correction of the position to Nature if possible. All of the causes are not understood, but the following are the more important ones: 1. Flat pelvis; 2. Primary brachycephalia; 3. Pendulous abdomen; 4. Large pelvis; 5. Prolapse of an arm in front of the occiput; 6. Anything that would prevent anterior rotation of the head or descent of the child's body, such as the placenta, tumors, scars, a full rectum or bladder; 7. Exhaustion of the uterine muscle; 8. Abnormalities in configuration of the bony pelvis; 9. Abnormal pelvic floor.

The treatment of persistent occipito-posterior position requires good obstetrical judgment as well as skill. If the head is not engaged, it is best not to interfere directly. If non-engagement is due to weak pains, having the woman walk around the room is a great assistance. By all means try to prevent rupture of the membranes. If the pelvis is not considerably contracted and there is no other condition present which requires treatment in itself, watchful waiting should be done until a definite cause for interference arises, true exhaustion being considered a cause.

If no progress is being made after waiting a sufficient length of time, and danger is anticipated but not necessarily present, and engagement is held up on account of non-dilatation of the cervix, a safe method of dilatation should be instituted. Here it might be said that manual dilatation without lacerations is considered impossible. Having secured dilatation of the cervix, anterior rotation of the head and engagement should then be attempted by manual manipulation, or anterior rotation should else be brought about by manual manipulation and by engaging the head in the pelvis with forceps, leaving the completion of labor to natural forces, which ideal result is to be expected if other conditions are right. This procedure is much safer than to complete the labor with forceps at this time, or than version and extraction, except, possibly, in multiparous women who have plenty of room in their pelves.

After engagement has taken place and the cervix is dilated, if anterior rotation and descent are arrested, other treatment is required. Having the woman lie on the side to which the occiput points often favors rotation. If the pains are weak and walking does no good, putting the woman in a sitting position with the thighs markedly flexed on the abdomen will favor descent and increase the diameter of the outlet as well as increase the expulsive power, but too much force must not be brought to bear, especially before correction of the position.

If the proper aseptic technic has been instituted throughout the labor, fear of infection should not prevent the accoucheur from practicing his art, because the severe exhaustion brought on by prolonged and ineffectual labor will enhance infection as much as manual interference will.

When correcting an occipito-posterior into

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an anterior position, it must be remembered that, unless the child's body is rotated also, the head will not likely remain in the desired position. Therefore, internal and external manipulation must be combined. The method which has been most successful in the author's experience will be described. With the woman sufficiently well anaethetized to give relaxation, but not entirely abolishing uterine contractions, she is placed on a table high enough for the operator to work efficiently. Using the right hand in R. O. P. and the left hand in L. O. P., the hand is inserted into the birth canal as far as is necessary, so that the fingers and palm rest on the anterior side of the head and face in front of the median axis of the child's head. The thumb extends across the top of the head and lies on the side of the vertex behind the median axis of the head, this being in the region of the lambdoid suture. While the internal hand disengages the head if necessary, and flexes and rotates it, the external hand rotates the body by means of traction on the shoulder. When rotation has been accomplished, the internal hand leads and the external pushes the head into engagement in the desired position, holding it until a few pains have exerted their effect. Sometimes it will be necessary to insert the hand past the child's face to the posterior shoulder and with the tips of the fingers rotate it past the promontory of the sacrum, the palm of the hand turning the head with it, bringing the occiput anteriorly. Whether or not forceps should be applied now depends on the other conditions present, but generally speaking, Nature should be given another chance. However, if forceps are necessary before the perineum has had an opportunity to become sufficiently relaxed, an episiotomy will accomplish much in time and in preventing injurious lacerations.

The contraindications for this procedure are: 1. Marked disproportion; and 2. Uterus being near the rupturing point.

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HABITS IN CHILDREN AND THEIR INFLUENCE ON BEHAVIOR.*

By ALFRED GORDON, M. D., Philadelphia, Penn.

To discuss "the child" is an endless task. Its characteristics, tendencies, emotional life, development,—finally, its behavior and conduct—are all such vast chapters of study and observation that each of these elements will require a separate volume in order to present them in a more or less complete form. The child's age is the period of life when foundations must be laid for the building up of a physical, mental, and emotional structure which will direct in one way or in another the individual's relation to other members of the community in which he lives and which will contribute to the happiness and progress or else to the misery and failure of his surroundings. It is at that age that initial direction is acquired for those forces which will guide the future man or woman in their adaptations in the struggle for existence. Adaptation implies the cooperation of a great many units of the individual's mental and emotional characteristics. There must be a constant conflict among the latter with the end result either of victory or of collapse. This will be manifested in the individual's "behavior." Behavior then is the resultant of the individual's life adaptations. To cover in one discourse all important forces which influence behavior will necessitate considerable time. Among the large number I have selected only a few because they present a special practical interest and a serious problem for the parents. In discussing them, I will not fail to bear in mind that I am addressing an assembly of lay persons and consequently will avoid terms, interpretations and explanations of an academic character.

In the life history of a child there are a few special features which frequently give the parents considerable concern. I have reference to "special habits" which the child acquires before the school age and during the latter. I shall not dwell upon a few habits observed in early infancy, such as thumb-sucking or tongue-sucking, which parents frequently encourage to prevent the child from crying, thus obtaining rest. I shall not arrest your attention on teeth-grinding or nail-biting which, although they have their special meaning, nevertheless are not of sufficient practical importance to elaborate upon. I will entertain you with more serious manifestations which occur in childhood beyond infancy and which may have a direct and grave influence upon the formation of the child's character and future behavior.

When a child develops a desire for telling

*Address delivered in Philadelphia during the Child Health Week, May 11, 1928.

"lies," which desire becomes eventually a strong habit, the situation is serious. This phenomenon is the result of several causative factors, chiefly of inheritance, but, let us remember, also of environmental circumstances. Parents and teachers should not ignore the fact that it is important and it is possible to prevent the full development of the tendency for lying the moment it is first noticed, because it is susceptible to treatment. The common belief that lying in a child is a necessary evil is a grave error. The lie may be at first only an occasional occurrence, but when it is permitted to repeat itself, it may gain such a strong foothold and become such a deep-seated habit that it might become difficult to be eradicated and this pernicious habit is carried to adolescence and manhood or womanhood, affecting daily life in all its phases and leading to very serious consequences, with criminality as a result. Permit me, therefore, to present to you a few hints which may be helpful in the management of this abnormality. First of all, it is necessary under all circumstances and conditions and as early as possible to be frank and truthful with children. Should the child commit his first or a repeated offense in telling a deliberate untruth, no undue punishment should be administered. In fact, punishment in all such cases does no good, because it creates and develops fear, which by itself is the cause of lying. Thus, the child will be obsessed on one hand by fear of being punished for telling lies and on the other hand he will tell lies to avoid punishment. He will live in a vicious circle. There is another important warning to the parents and teachers when they are confronted with evident children's lies. It would be very wise and prudent not to question such children too closely on the subject of their lies. Unless the questioning is done skilfully and intelligently, such a procedure may lead to forced misstatements on the part of the child, which eventually may develop into deliberate and conscious deception and fraud and thus prepare the individual for a life of delinquency and all kinds of criminality. Proceeding further, I may also caution you against an unnecessary and perhaps harmful method in dealing with lies in an immature child. That is, preaching and pointing out to this undeveloped bit of humanity the evils of lying is not only useless but it may become harmful for the following reasons: First, in so doing we may exaggerate or magnify the most insignificant deviation from the truth. Second, we may suggest to the child undesirable thoughts which otherwise would have never perhaps entered the child's mind, and, as you know, a child is extremely susceptible. When parents and teachers keep on admonishing the children with: "You must not do this or that, you must not speak so and so," such a procedure is by itself a suggestion to the child for violating prohibited acts. On the other hand, when the child is taught and shown how to control himself on every occasion, and how to own up to a mistake or to a wrong act committed by him, when all that is done in a kindly and intelligent manner, the child's confidence will be gained and the results will be most gratifying in the struggle against repetition of falsehoods. In our attempts to correct the habit of lying in children, we must invariably hold their attention close to reality and not to fantastic and abstract ideas on truth and untruth, because over-stimulation of their imagination may prevent them from discriminating the real and the unreal.

The second abnormal habit in children which may lead to grave consequence is "stealing." We all know that a child has no sense of personal property. Not infrequently we observe children wanting to go through the pockets of others. Some of them, when they are sent on errands, do not spend as much as they are told to do and keep the balance for themselves. Some bring home things which, they say, were found by them on the street. These are all examples of various forms of theft. They are all serious and even dangerous habits, as they mean encroachment upon another's private property or an aggression by himself toward another person. They mean the existence in the child of a strong pernicious desire to deprive another person of things to which he is not entitled or to attack the rights of other people. They mean that if this habit is maintained during childhood, grosser delinquent acts of a more serious nature will be committed later in youth and adult age, such as pocket-picking, purse-snatching, stealing unlocked property, burglaries, highway robbery, larceny of all degrees, forgery, passing worthless checks, etc. Not infrequently we see children supplied by their over-indulgent parents with ample pocket-money. If this habit is established and for one reason or another the

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child should be deprived of further supply, he may resort to stealing in order to satisfy his taste or greed for luxuries developed by unreasonable parents.

The third form of habits in children which may lead to grave consequences is "truancy or vagrancy." It usually happens that during the day, when the child cannot find desirable companions for play or other purposes, he runs away either from school or from work. A poverty-stricken or an unhappy home with bad surroundings may lead the boy to abandon it temporarily and repeat the act so frequently that a habit becomes established. When the school teacher is unable to understand her pupils, especially the neurotic children, and handles them unreasonably either by exacting mental work for which they are not prepared or threatening or punishing them severely, such children will look for and find opportunities to run away from school. In some such instances I observed children leave their homes in the morning for school but never reach it, and go off with undesirable gangs in a different direction. Restlessness, irritability, nervousness and especially discontent either with their home or school made those children find a way whereby they could obtain satisfaction or at least relief and an outlet for their pent-up emotional forces. As a rule, these truant children spend their time in company of other young or older delinquents, and they fall into further delinquency in either case. Statistics show that truancy or vagrancy is a factor in over half of the cases of various delinquent offenses against society. Much can be done for these truant youngsters if parents would be sufficiently interested to make sacrifices of their time or to try to surround the children with desirable companions for whom they crave. Since truancy represents an effort to escape from an undesirable environment, it should be looked upon with grave concern. Punishing a truant child will accomplish nothing and does not solve the problem.

These few examples are chosen to show how vast and complex is the problem of dealing with children. Habits and especially bad habits are very difficult propositions for parents. They are the most potent factors in delinquency. A wrong act once committed may be repeated more or less automatically by force of habit and especially when it may bring pleasure or satisfaction. The more often the delinquent behavior is repeated and the more it is attended with pleasant circumstances, the more established becomes the habit. Moreover, a delinquent habit may persist long after the original cause of its existence has disappeared. We may even remove the cause which leads a boy to steal, pick pockets, lie, run away from home or school, but still the delinquent habits may remain because of habit.

Let me now point out to you with some emphasis some of the conditions which may contribute to the formation of undesirable habits and to delinquency. I will not dwell on bad inheritance. That instinctive and hereditary tendencies are the roots from which the physical, mental, and moral life develops, is a well-established fact. Not much can be accomplished in cases of children with inherent mental limitations, but personality and its component parts are also to a considerable degree molded by environmental conditions. It is on the latter that our efforts must be concentrated, as they are amenable to improvement. Among the environmental elements, "home" is the most potent. In considering home conditions, the following may contribute to delinquency:

1. Unsanitary features: They undermine the child's physical health and indirectly his mental health and, consequently, reduce his vitality and his power to control his behavior.

2. Crowded homes: There children frequently witness scenes between the elders which gives their immature minds suggestions for delinquency.

3. Material poverty, which may lead to lying and stealing. With poverty are closely associated ill health, over-crowding, neglect, ill-tempered parents and so-forth. Thefts of all kinds and hold-ups result from longing for food, clothing, shelter. Fifty-five per cent of young delinquents in London come from homes that are below the poverty line.

4. In some cases excess in material things permitted by over-indulgent parents leads to a lack of appreciation of values and poor self-discipline, with the result that the child may become incorrigible and commit offenses ranging from petty larceny, setting fires, burglary and even murder.

5. Disrupted homes, either through death of parents or divorce. In both cases the child loses necessary examples, guidance, discipline or affection, which all are so essential in his development. It was observed that 79 per cent

of delinquencies occur where the home was disrupted during the childhood of the individual.

6. Mental abnormalities of parents, bad habits of parents, such as drunkenness, immorality or criminal tendencies in the parents, are bound to have a pernicious effect on the children through the innate tendency for imitation, misguided teaching, disgust, antipathy against the home shame, a feeling of degradation, and loss of respect for parents. Lying, stealing, and running away are common occurrences, all resulting in gross delinquencies.

7. Ill treatment by guardians, foster-parents, or step-parents leads the child gradually to truancy or vagrancy; he then gets in with gangs, and thus drifts into delinquency. In all such cases a feeling of resentment develops in children against those people. Because of this feeling, their influence by work or example becomes insignificant. The child may become stubborn and this state will keep him from being benefited by the small amount of parental discipline. He will then remain a slave to his instincts and emotions.

8. Unhappy relationship between father and mother is a frequent cause of the child's unhappiness, which, if continued, will develop undesirable tendencies in him.

9. Finally, misdirected discipline is a frequent cause for delinquency. Over-indulgence or else over-restriction on the part of the parents makes the child react in an abnormal way. Desire for forbidden things becomes great and the child will seek satisfaction outside of home in a delinquent manner. Forbidding things in an unreasonable and inconsistent manner will react on the child so that he will oppose his parents in everything and it will make more intense his desire to do forbidden things until it gets the best of him. If severity and punishment are practiced, the child will seek satisfaction outside, with a bad effect on his behavior. Favoritism and injustice are promptly felt and resented by children. They lose respect for parents and seek compensation in abnormal ways. Nagging and creating fear in a child is dangerous for its physical and mental development. The fear fixes the undesirable tendency in its mind and it attempts to escape from it through some abnormal act.

All these factors must be borne in mind when we are confronted with cases of bad habits leading to delinquencies. No individual case can be treated in a satisfactory manner without adequate knowledge of all causes of the trouble. Facts must be obtained from many sources.

In concluding the few thoughts presented here, I wish to emphasize the fact that all I said is only a small part of all the causes of delinquency. I have selected but a few to indicate how serious the problem of the child is. Among all the factors that enter into consideration when the personality and behavior of the child are observed and studied, "parents and home" are the most potent elements which have an influence on and shape the destiny of the future man and woman. The home must be considered the workshop in which the personality of the child is being developed. The character, attitude, and mutual relationship of parents and the child lay the foundation of the mental atmosphere in which the child lives, grows, imitates, undergoes suggestions, forms habits, and prepares himself for future activities to become a member of the community and in his turn to become a parent when he will play his part in developing the personalities of the next generation. The child who is deprived of sympathy and affectionate attention at home misses the most important elements in his preparation for mental and emotional growth. Encouragement to effort and confidence in himself, relief from emotional strain, sympathy that helps a child bear bravely gross and small disappointments, development of affectionate response in cases of unhappy incidents in the life of father, and mother, and of the outside world—all these elements are highly essential in the development of a normal child. Should they be lacking in the home, the child's behavior will suffer irreparably. The lack of joy in home or the want of emotional comfort will lead the child to abnormal tendencies and undesirable habits, such as were mentioned above, and turn the child delinquent with all the unhappy consequences to himself and to the community in which he lives. Statistics show that home is overwhelmingly more influential than the street in producing delinquency. Home environment in all its details presents the best field for preventive work.

1812 *Spruce Street.*

THE INTRAVENOUS ADMINISTRATION OF SODIUM IODIDE IN THE TREATMENT OF GONORRHEAL EPIDIDYMITIS.*

By J. S. CHALMERS, M. D., Ada, Okla.

During the past ten years intravenous medication has been receiving considerable attention and much experimental work has been done with many chemicals along many lines. This work has been largely done in the diseases of bacterial origin, although others of parasitic and mycotic origin have come in for their share. It is not surprising that gonorrhea and its complications have come in for a large part of this investigation, due to the prevalence of the disease, its social and economic importance.

Etiology and Incidence.—The mode of infection may be by direct extension from the urethra through the vas, by the blood stream—due to lowered resistance and trauma,—and through the lymphatics in the sheath of the vas. Traumatism to the urethra and testes is without doubt responsible for many cases, particularly that trauma due to forceful irrigation, instrumentation and strain.

Various estimations place the incidence of epididymitis of gonorrheal origin at from 5 to 20 per cent, with bilateral cases forming about 3 to 7 per cent of the total number of cases.

The work done with sodium iodide in the treatment of gonorrheal epididymitis seems to have had its origin in the observations of Stern and Ritter in 1920. In 1922, Ravich, in a report covering one hundred and sixty cases, noted excellent results from its use. Wright, in 1923, also reports uniformly satisfactory results in a series of cases.

Rodriguez, in the *Journal of the P. I. M. A.*, reports ten cases with uniformly good results; and Chenery, in the *U. S. Naval Bulletin*, also reports satisfactory results from its use. Young, of Baltimore, and Wolbarst, of New York, also report the successful treatment of gonorrheal epididymitis by this method.

In my own practice I have had seven cases which I have treated by this method with uniformly satisfactory results. The preparation used was one of the standard ten c.c. ampules containing fifteen grains of the iodide. This was given intravenously at forty-eight hour intervals from the onset of the disease and continued until there was no longer induration of the epididymis or swelling of the testicle. From four to six injections were found necessary.

In addition to the sodium iodide, all of my cases received oral medication for urinary antisepsis. Hexylresorcinol was given in three cases, and a preparation of kava kava and santal oil, sold by Reidel under the name gonosan, was used in the other four. The latter preparation seemed to have a greater specificity for the gonococcus than did the former, and, as the preparation is much less expensive and does not produce nausea or loss of appetite as does santal oil alone, I am continuing to use it. In addition, the scrotum was suspended in the usual manner. An ice-bag was applied during the first few hours of the disease, and free purgation instituted.

There were no untoward effects noted in any of the cases and the only complaint was that a few moments after receiving the sodium iodide a salty taste was experienced, which persisted for several minutes.

The mode of action of sodium iodide is not exactly known. Kolmer, in answer to the question, "How do iodides produce these results?" says: "I believe that the answer is to be ascribed to the effects of an increase in the proteolytic activity in the pathological tissues, secretions and exudates, as explained by Jobling, Peterson and Eggstein, along, possibly with an actual increase of proteolytic ferments, as suggested by Dick". Kolmer further states that iodides do not act on normal tissues as they do on diseased tissues, apparently due to the fact that tissues devitalized by spirochetic, bacterial or sterile chemical agents, absorb more iodine than normal tissues.

In a further survey of the pharmacology of sodium iodide, I found in Sollman, and in Kolmer, while iodides are absorbed from the stomach after oral administration in from ten to fifteen minutes, that iodin cannot be demonstrated in the blood in more than traces, whereas, after intravenous administration it is found in the serum in concentration of 6 to 9.9 per cent. It is further stated, while 75 per cent is excreted within twenty-four hours, that complete excretion probably does not occur under forty-eight hours or longer, dependent upon the saturation of the individual and the efficiency of the excretory organs.

In amounts less than ten grams given in one hundred c.c. of water, no toxic results are

*Read before thre Clinch Valley Medical Society, at Tazewell, Va., April 26, 1928.

noted in the average adult, and toxic results in amounts greater than this are not due to the action of the iodide but to the introduction into the blood stream of too great a quantity of a hypertonic solution.

Experimental evidence shows that the retained iodides are found in the thyroid, blood, secretory and lymph glands, kidneys, intestine, testes, and bone, the amounts being in the order named.

The course of my cases is as follows:

Case 1. White, male, age 19, mechanic. First seen August 28, 1927, at which time he complained of pain and swelling of the right testicle. Nine days prior to this he had had intercourse with a clandestine prostitute, and five days thereafter first noticed a discharge from the urethra. He had been treating this himself up until the appearance of the epididymitis.

Examination showed a marked enlargement of the right testicle with the epididymis indurated and intensely painful. The temperature at this time was 102 F. He was sent to the hospital and when seen there four hours later complained of pain in the left testicle. The following morning this was also definitely involved. The urethral discharge at this time was profuse. On August 29, he was given ten c.c. of sodium iodide intravenously; the scrotal sac was suspended, and hexylresorcinol, two capsules after each meal and at bed time, was given. Due to the intensity of the pain, morphine was given at this time and repeated some hours later. Within twelve hours the severity of the pain was considerably lessened, and within thirty-six hours the patient was quite comfortable. The temperature had subsided to about normal. The urethral discharge continued to be profuse. Intravenous medication was repeated at forty-eight hour intervals, and on the fifth day the patient was discharged from the hospital. At this time there was absence of pain and temperature, only slight enlargement of the epididymis, and a diminution of the urethral discharge. After returning home, he remained in bed four days, and resumed work the following Monday, having been off for two weeks. In this case five injections were given. After a lapse of four weeks, during which time he was kept on hexylresorcinol, irrigation was resumed with a rapid clearing up of the urethritis. Massage of the prostate and seminal vesicles after the cessation of the discharge was negative for pus or bacteria. On March 1, 1928, on examination of the seminal fluid, motile spermatozoa were found in large numbers, proving the patency of at least one of the ducts.

Case 2. White, male, age 19, student. Contracted gonorrhea September 1, 1927, and treated himself until September 19, 1927, at which time he came in with the complaint of pain and swelling of the left testicle. On examination, the testicle was found to be slightly enlarged and the epididymis indurated and tender. His temperature at this time was 101 F. This patient was given ten c.c. of 10 per cent sodium iodide at once. He was then put to bed, the scrotum was suspended, and an ice-bag applied; he was also given hexylresorcinol, two capsules after meals and at bed time. Pain and temperature subsided within twenty-four hours, and the day following the second intravenous injection the patient walked to the office. At that time there was no pain and only a slight swelling of the lower lobe of the epididymis. He was, however, given two more intravenous treatments. He resumed his duties in seven days and played football within three weeks without further trouble. There was only a slight urethral discharge during the course of the epididymitis, which became more profuse after the epididymitis subsided, but which yielded readily to treatment after irrigations were resumed.

Case 3. White, male, age 25, carpenter. Would not admit having had gonorrhea. Came in complaining of pain and swelling of the right testicle, of two days' duration. There was no urethral discharge, but rectal examination showed the right lobe of the prostate to be enlarged and very tender, and the right seminal vesicle was also enlarged. The patient's temperature at that time was 100 F. This patient was given ten c.c. of the sodium iodide solution at this time and was sent home to bed. He was also given hexylresorcinol, two capsules after meals and at bed time. When seen again two days later, he was free from pain and temperature and had only a slight swelling of the testicle and epididymis. He was given a total of four injections of the sodium iodide, but had returned to work the day following the second injection, making the time lost since beginning of treatment only four days. Ten days after the last intravenous treatment, following massage of the prostate and seminal vesicles, considerable pus was found in the urine, but on a slide stained by

Gram's method no cocci could be found, nor were any demonstrated on other slides made during treatment of the prostatitis.

Case 4. White, male, age 17, student. Contracted gonorrhea early in August, and at that time consulted a physician who gave him some local treatment and later gave him an argyrol solution to use at home. He had been using this for about four weeks and the urethral discharge had practically ceased, when one day, after rather strenuous play, he began to feel pain in the right testicle; this rapidly became swollen and intensely painful. On September 30, two days after the onset of the epididymitis, he came in for treatment. At this time the epididymitis was well defined and the urethral discharge was fairly profuse. He was given ten c.c. of 10 per cent sodium iodide at this time; the scrotum was suspended and he was given kava santal, two capsules after meals and at bed time. Two days later when the second intravenous treatment was given, pain was entirely absent, there was a diminution of the swelling, and the urethral discharge was considerably lessened. The second day following, the patient walked to the office for the third treatment. At this time, aside from a slight swelling at the lower pole of the epididymis, there were no remaining signs. He was given a total of four intravenous treatments and returned to school the following week. There was a slight urethral discharge which cleared up within a short time after irrigations were resumed.

Case 5. White, male, age 40, business man. Contracted gonorrhea and had treated it himself. The discharge had ceased some two weeks before I first saw him. On October 1st he took a long automobile ride over a particularly rough road and on his return home that night had some pain in the left testicle. This became more intense and on October 2nd I was called and saw him at his home. At that time there was a well defined epididymitis with considerable swelling of the testicle and induration of the epididymis. His temperature at this time was 102.5 F. The scrotum was suspended, an ice-bag applied, and codeine given. An hour or two later ten c.c. of sodium iodide was given intravenously. When seen the following day the temperature was still over 100 F. The swelling was practically unchanged but pain was absent. On October 4th, a second injection was given. At this time the temperature was normal and there was a marked decrease in the swelling. The following day the patient was feeling so well that, without my knowledge, he got up and walked about. That night there was a recurrence of the pain; his temperature went up and it was again necessary to give him codeine. This time he remained in bed another four days, during which time he was given three more intravenous treatments. By that time the swelling had subsided and there were no further symptoms. There was no urethral discharge at any time during the course of the epididymitis, nor following it; however, as a precautionary measure, kava santal, one capsule four times a day, was given during the time he was under treatment.

Case 6. White, male, age 45, taxi driver. This man was first seen on March 31, 1928, at which time he complained of pain in the rectum and the occasional discharge of purulent material from the urethra. He gave a history of gonorrhea some years before. On examination, he was found to have a soft boggy prostrate. A three glass urine test showed large quantities of pus in the third glass; smears, however, were negative for the gonococcus. He was given prostatic massage, followed by irrigation. This was repeated at forty-eight hour intervals up until April 2nd, on which date he developed an epididymitis. He was given ten c.c. of sodium iodide at this time, the scrotum was suspended and an ice-bag applied. His temperature was 101 F. Pain was intense and he was given pantopon. It was necessary to give codeine *per os* for the succeeding forty-eight hours, as the pain continued severe until the day following the second injection. Temperature had become normal within thirty-six hours after the first injection and remained so during the remainder of the disease. Swelling increased during the first forty-eight hours, and a slight urethral discharge appeared which became more profuse for forty-eight to seventy-two hours; thereafter, it became progressively less until before he had recovered from the epididymitis it had ceased. The epididymitis did not completely subside until April 13th. He was, however, up and about on April 11th. He was given a total of six intravenous treatments and, in addition, kava santal, two capsules four times a day.

Case 7.—White, male, age 39, business man. Contracted gonorrhea about March 1, 1928. He was treated by a competent urologist and

before April 1st he no longer had any urethral discharge. He continued, however, to irrigate himself for another week. On April 14th, believing himself well, he had intercourse and within twenty-four hours came to me with a well defined epididymitis, the right side being the one involved. His temperature was 99.6 F. There was a moderate swelling of the testicle and marked induration of the epididymis. He complained of extreme pain. He was given ten c.c. of sodium iodide, the scrotum was suspended and an ice-bag applied. Codeine was given for pain. There was no urethral discharge at the onset of the epididymitis, but a slight discharge appeared on the second day, which had ceased by the fourth day. The patient was given a total of four intravenous injections, and the day following the fourth was able to attend to his business. Pain and temperature had subsided within twenty-four hours after the first injection. Kava santal, two capsules four times a day, was given through the course of the epididymitis and continued for a few days after it subsided.

Summary and Conclusions

The administration of sodium iodide has not been attended by any untoward results in any of my cases, nor have any been reported by others.

Relief from pain was noted in most cases within twenty-four hours, with an accompanying lowering of temperature and reduction of swelling. The period for which patients are incapacitated, is generally shorter than those treated by local applications, and, due to the absorption of exudates, there is probably a much lower percentage of sterility resulting from the condition.

Oral medication for urinary antisepsis should accompany the intravenous medication.

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REPORT OF A CASE OF PSYCHIC APHONIA.*

By T. E. OERTEL, M. D., Augusta, Ga.

According to my best information the first recorded disorder of speech from psychic causes occurred at a place called Babel and seems to have simultaneously afflicted most of the inhabitants. It may, however, be possible that a prior case was made manifest when one Adam said, "The woman that thou gavest me." However, this may be, without doubt such disorders have been more or less frequent ever since man learned the use of his vocal organs for the purpose of conveying to others his mental processes. Doubtless there are many such manifestations of less degree than that which occurred in the case about to be cited. I thought it worth while recording because of the long duration and other peculiarities which render it somewhat unique.

On June 1, 1927, a lady called me over the telephone and said that her sister had not been able to speak for a period of three years, and asked if I thought there might be something done for her. Of course, I replied that I could tell nothing about it without seeing the case. Accordingly, she came to my office the next day, bringing her afflicted sister with her.

I was then given the following history:

Four years ago her sister, Miss C. M., a school teacher, age about thirty-five, had a runaway accident in which she was somewhat injured but only in a minor way. She did, however, suffer a severe nervous shock. Some months afterwards she underwent an abdominal operation for acute appendicitis. There was no apparent untoward result from this for several months when, suddenly, the patient began to show marked mental disturbance, became emaciated, probably because she would not eat, and was taken to the State Institution at Milledgeville, Georgia. On the way to the Institution she quit speaking. After a period of three months she was brought home and her mental condition slowly improved until at the end of two or three months she began to resume her household activities. Her improvement was now rapid, but her speech did not return.

Since then she has been under treatment by several physicians. She spent sometime in a neighboring city where she was kept for observation in a hospital. Here a diagnosis of brain tumor was made and operation advised. I have in my possession X-ray plates of her head which were then made and which showed an area at the vertex which I presume led to the above erroneous diagnosis. Dr. Holmes,

*Read before the Southern Section of the American Laryngological, Rhinological and Otological Society, at Greenville, S. C., January 28, 1928.

our Roentgenologist at the University Hospital, assured me that this hiatus is probably due to a developmental error and that it is not at all uncommon. In his opinion, the X-ray plates showed no evidence of brain tumor.

For the last two years she has been Corresponding Secretary for a state society and is in every way mentally alert and of more than usual intelligence. She now fills a position as clerk to the Ordinary of her county which position she has held for the past two years.

The above information was not all elicited on the first visit as her sister did not wish to speak too plainly in her presence but came to see me the next day to supplement what she had already told me.

I found the patient to be a buxom young woman with red cheeks and intelligent countenance. She carried a pad and pencil and answered all my questions in writing. When asked about her disability of speech she simply wrote that she could not talk or make any sound whatever. I noticed, however, that in laughing a slight sound was produced. Upon examination of the throat and larynx I could find no evidence of abnormality. When she laughed, as she did while under examination, the chords approximated but she did not seem to be able to control the musculature of the larynx by voluntary effort. I concluded that I had a case of psychic aphonia with which to deal, and that mental suggestion and encouragement would probably effect a cure, if I could succeed in gaining her entire confidence. This I set about doing by assuring her there was no physical reason why she could not talk and that in a short time under my guidance and help she would again be able to converse as she did formerly. She seemed rather doubtful of the outcome and so expressed herself in writing. I talked with her for some twenty minutes, explaining that as she had not used her voice for such a long time progress would probably be somewhat slow, and that if this were the case she must not be discouraged.

I told her she must begin to learn to talk over again and that first we would start by saying the alphabet and asked her to repeat after me the letter K. This she was unable to do, making a fantastic face and rolling her tongue around her mouth in the effort. I then instructed her as to how to place the tongue in the roof of the mouth to formulate the first sound of the letter by an explosive expiration and succeeded in getting her to do this, although she made no sound. I then dismissed her with the instruction that she must go by herself where there would be no one to embarrass her and practice saying the letters of the alphabet before a looking glass. This was to be done daily in two periods of twenty minutes each. She was told to report at the end of the week. When she returned at the expiration of this time, she came in smiling and wrote upon her pad, "I can say my alphabet." I asked her to do this for me and she succeeded quite well, although the sounds were made in a low tone and some of the letters imperfectly pronounced. I patted her on the back and assured her that she had made wonderful progress and that she would soon be talking. For her next lesson I gave her one syllable words, such as cat, rat, man, boy, girl, and the like, and told her again to report at the expiration of a week. When she came back she was beaming all over and in hesitating tones said to me, "I have thrown away my pencil." I again congratulated her and assured her that within a few days she would be talking as well as ever. She came again at the end of a week and talked as naturally as one could wish.

Now, of course, this is no very unusual case, nor is it a miraculous cure. It was simply a question of correct diagnosis in the first place, and gaining the confidence of the patient in the second. Why those under whose care she had formerly been should have mistaken the true nature of her malady I do not know, but we are all subject to error. It does seem, however, that such instances of mental aberration with fancied physical derangements should put us on our guard to be constantly on the outlook for similar conditions in which the manifestations are not so marked. In other words, we must treat our patients not only with drugs or the surgeon's knife, but with the true insight as to the tremendous effect that the mind may have over the body, and such healthy advice and guidance as may be suited to their individual needs. Omitting to do this, we have only half performed our duty towards them and have failed in one of the most important functions that a physician has at his command. It is upon such cases that the charlatan or quack, the chiropractor, and others of this ilk, fatten. One can imagine what an enthusiastic letter of recommendation might

have been given by this grateful patient to some so-called religious healer or medical imposter into whose hands she might have fallen and who doubtless could have produced immediate return to normalcy of speech.

I have reported the case not only on account of its intrinsic interest, but also to again call attention to our duty as physicians to be careful not to overlook the immense importance and aid which we have at our command if we can treat not only the physical but the mental condition of those who come to us for help.

Southern Finance Building.

PYELITIS.*

By R. F. THORNHILL, M. D., Pulaski, Va.

Pyelitis is an inflammation of the mucous membrane of the pelvis and calices of the kidney. No other kidney condition will be spoken of except the above.

Etiology.—This is always due to bacteria, with the exception of chemical irritation, the chief way of entry to the kidney being through the blood stream; passage through the lymphatic stream is possible, but rare; while ascension up the ureter is possible, but exceptional. The florae of bacteria are numerous. The acute infections are ususally due to the staphylococcus, streptococcus, typhoid bacillus, gonococcus, pneumococcus, etc. Practially all chronic cases are due to the typhoid and colon bacilli.

The contributory causes are stones, hydronephrosis, pressure on the ureter from without, retention of urine, local infections of other parts of the body, cystitis, and general infections, etc.

Symptoms.—There are a great variety of symptoms, as fever, no type of fever, however, being characteristic of pyelitis; it may be continuous, remittent or intermittent, nor does the degree of temperature depend upon the severity of the case. Pain is very peculiar in its characteristics, is rarely found referable to the kidney, although some complain of dragging pain in the back, while others will complain of lumbar region pain and occasional renal colic pain.

Urination is one of the outstanding symptoms in regard to frequency of micturition at night, due to large quantity of pyuria and irritability. Other symptoms, which may or may not be, are nausea, vomiting, muscular rigidity, chills, etc.

Diagnosis.—Careful examination of urine from ureter is necessary. In acute cases, urine findings are alubumin, red blood cells, pus cells, bacteria. In chronic cases, practically the same findings are made as in acute cases, except red blood cells may be absent. It is a matter of considerable importance and interest to know that pyuria of kidney origin is almost always associated with a large amount of serum albumin; on the other hand, many pyurias are of vesical origin, and show no serum albumin, although there are exceptions in both cases.

Cystoscopic examination may disclose any degree of cystitis, which is often present. Lesions vary around the ureteral orifice of the affected side; you may see a reddened, sprouting opening, or a retracted opening, or there may be much difficulty in finding the ureteral opening. If pyuria is intense, turbid urine can be seen on the affected side, and clear on the other. If indigo-carmin has been used, a marked difference is shown. The function of the kidney and urine content and character are determined by catheterization of the ureter alone.

Many cases of chronic pyelitis are associated with strictures of the ureter. However, every case where obstruction is met in introducing the catheter must not be regarded as stricture, but should be examined thoroughly by functional tests and X-ray to determine to what the obstruction is due.

When a diagnosis of pyelitis is made, a very careful examination should always be made to determine if there is any focal infection, especially in gonococcus cases. Blood pictures in pyelitis are of no definite value in making a diagnosis.

Prognosis.—This depends upon the extent and stage of the disease. Acute cases usually subside and heal rapidly under appropriate treatment. On the other hand, chronic, long standing cases, are most difficult and often impossible to clear up.

Treatment.—In acute cases, rest in bed, mixed liquid and soft diet, water freely by mouth, mild laxatives chiefly of saline nature, and some urinary antiseptic by mouth, which depends chiefly upon urine reaction, particularly the formalin liberators where possible to be taken. If there is nausea and vomiting,

*Read at the meeting of the Southwestern Virginia Medical Society, in Marion, March 29-30, 1928.

saline solution or glucose in saline solution may be used intravenously; if continued high temperature, mercurochrome, 1 per cent aqueous solution intravenously, may do good. Any primary focus of infection must be found and removed if possible. If no results are obtained and no local condition is found in the kidney to account for a bacterial attack, it should be determined by kidney lavage, which is most important in certain types of cases. Kidney lavage or washing out the renal pelvis through the ureteral catheter with sterile water, 2 or 3 per cent boracic acid, or some similar solution may be tried. Lavage should be followed by silver nitrate or mercurochrome, 1 or 2 per cent solution of either. If there is a pronounced inflammatory or pus condition coming from the kidney, the catheter should be left in ureter and irrigated every 12 to 24 hours until it clears up.

Correspondence

Diphtheria Toxin-Antitoxin and Antitoxin.

The following is a letter which has recently been issued by the State Board of Health. We are giving it this additional publicity on account of the great importance and value of toxin-antitoxin as a preventive of, and antitoxin as a means of combating diphtheria.

November 14, 1928.

To Virginia Physicians:

As so many doctors have asked advice regarding the protection of children who have been exposed to diphtheria, particularly as to the use of toxin-antitoxin or antitoxin, we are sending this general letter. A rule cannot be made to suit all cases and conditions. We will state certain facts and leave their adaptation to the judgment of the doctor to suit his cases.

Diphtheria antitoxin (1,000 units for prophylaxis) gives passive immunity which begins promptly at its maximum and then gradually wears off and disappears in a few months.

Toxin-antitoxin gives active immunity, which is slight at first and gradually increases until it reaches the maximum in three or four months and lasts practically a life time.

Antitoxin has a large amount of animal serum which produces sensitization to similar serum. This sensitization is likely to bring about anaphylactic reaction should it be necessary to give antitoxin for diphtheria or tetanus at a later date.

Toxin-antitoxin has such a small amount of animal serum that there practically is no sensitization and no danger of subsequent anaphylactic reaction.

The danger of children exposed to diphtheria in the same family contracting the disease is hardly 10 per cent. In a school room the danger is even slighter. If a child is exposed and can be watched for the first sign of sore throat, it might be advisable not to give him antitoxin for prophylaxis. If, however, he has been intimately exposed and lives a distance in the country where the prompt services of a doctor will be difficult to secure, it might be better to give antitoxin. Here is where the judgment of the doctor must be used.

Toxin-antitoxin should be given whenever the opportunity is afforded. There is no occasion to wait until spring to give it. It gives a certain amount of immediate immunity and many recommend giving toxin-antitoxin instead of prophylactic antitoxin even during an epidemic. The sooner given the sooner the protection develops. The giving of toxin-antitoxin does not contra-indicate the use of antitoxin should the child develop diphtheria before the toxin-antitoxin confers immunity.

Ennion G. Williams,
State Health Commissioner.

Roentgenology

Roentgen-Ray Diagnosis

LEOPOLD JACHES, M. D., Radiologist, Mt. Sinai Hospital, New York City.

(*Continued from page* 552)

Tumors.—Tumors of the lung which are either primary or metastatic, endobronchial or parenchymatous (lobar) can be readily localized by the roentgen ray, but cannot always so readily be diagnosed as such by the roentgenogram alone. The history, a primary lesion elsewhere, and the age of the patient may be necessary for the diagnosis.

Primary tumors are always the carcinomas. The endobronchial, if small and causing no stenosis with consequent atelectasis, may not be demonstrated as early as the patient's symptoms manifest themselves. Often when there is a marked infiltration in the adjacent area the differentiation from a nonmalignant condition, such as pneumonia, cannot be made, and the

bronchoscope must be resorted to. Generally, however, there are metastases in the other lung or in the ribs, so that recognition of the lesion is not difficult.

Parenchymatous tumors may resemble lobar pneumonia.

Metastatic tumors, whether carcinomas or sarcomas, have an irregular distribution. Carcinomatous metastasis in particular often appears miliary in character, so that the differentiation from tuberculosis may be extremely difficult. The presence elsewhere of a primary lesion, whether operated on or not, and the fact that these infiltrations have a distinct circular outline which miliary tuberculosis has not, will help in their recognition. Another distinguishing feature is the frequent noninvolvement of the apexes.

The Pleura.—The normal pleura is not demonstrable by the roentgen ray, nor is dry pleurisy. When the pleura has become thickened, it casts a shadow whose density is in proportion to the thickening. Sometimes there is difficulty in differentiating it from effusions or pulmonary infiltrations.

Pleural effusions, whether serous or purulent, present equally dense shadows. The early fibrinoplastic exudate may be seen as a line running parallel to the periphery of the lung from apex to base. Larger free effusions, but without the presence of air or gas, will be seen as a density with a concave upper limit occupying the lower portion of the chest. Encapsulated effusions are generally present near the axillary border of the chest in the upper or the lower portions, or in both. They may be multilocular, but their shadows may fuse, so as to appear as one. Often the lower collection is smaller than the upper, and the surgeon is surprised at the small quantity of pus he obtains until he makes another incision higher up and drains both cavities. Interlobar effusions are readily recognized on the right side by the straight line running from axilla toward the hilum at the level of the sternal end of the fourth rib. On the left side the obliquity of the shadow generally prevents its demonstration.

Pneumothorax is brilliantly shown by the uniform transparency and by the absence of any lung markings in the side of the chest involved. The collapsed lung stands out very sharply against the air or gas, its density depending on the degree of collapse. Heart, aorta and mediastinum are generally displaced to the opposite side. When both fluid and air are present, there is a fluid level which shifts with the change of position of the patient.

Tumors of the pleura cause dense shadows, which are due to the thickening of the pleura itself or to the additional presence of fluid. The differential diagnosis can be made only from the history or the presence of metastases in the opposite lung or in the ribs.

Tuberculosis of the pleura, aside from presenting adhesions, thickening or an effusion, may in rare instances show irregular calcifications which can be localized on the pleura by stereoscopic examination.

The Diaphragm.—In the study of the diaphragm, the fluoroscope is more important than the film. Normally the diaphragm appears as a domelike shadow on both sides of the spine. The right side is generally higher than the left and merges with the shadow of the liver; the left, being situated over the stomach and splenic flexure, both of which contain air or gas, is seen as a narrow curved dense band. Depending on the stature of the patient, the position of the diaphragm varies. In tall, thin persons it is low, in the stout it is high.

Adhesions will cause irregularities in the convexity on either side. On the right side, however, there are often seen, on deep inspiration, small humps which are normal and should not be mistaken for adhesions.

Pulmonary tuberculosis or pneumonia often causes restriction in the movements of the diaphragm on the affected side, even if the lesion is at a distance above it.

Subphrenic abscess or other effusion results in an elevation of the diaphragm on the affected side. On the left side, where the effusion may be interposed between diaphragm and stomach, there is sometimes seen a broad dense shadow between the two with the gastric bubble below it.

Eventration, which is more frequent on the left side, will show the diaphragm as a narrow dense curved band high in the chest, with distended stomach and intestines below it. The heart and the mediastinum are displaced to the right.

The differentiation of this condition from diaphragmatic hernia is often very difficult. An opaque meal will sometimes place part or

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all of the stomach above the diaphragm in case of hernia, especially when the patient is examined in the recumbent or Trendelenburg position. Pneumoperitoneum, on the other hand, by showing the gas above the stomach and below the diaphragm, will help determine the presence of an eventration.

(To be continued)

Woman's Auxiliary, Medical Society of Virginia

News From the State Auxiliary.

There is very little to report concerning the Auxiliary this month. Owing in both cases to illness, the two delegates appointed to the Southern Medical Association meeting at Asheville were unable to attend. It would be of great assistance to the president in naming delegates if the members who plan to attend the various meetings would notify her of their intentions, so delegates and alternates could be selected well ahead of time. It is impossible to write all the members asking if they intend to go to meetings, but it will be a very simple matter for individuals to write to the President, Mrs. F. W. Upshur, 818 West Franklin Street, Richmond, Virginia, and say that they are attending a certain meeting. At present the names of those who are planning to go to the American Medical Meeting, in Portland, Ore., would be a great help. Please remember to pay your dues promptly, as otherwise Virginia will not get the credit for all her members and the number of our delegates will be reduced.

The Richmond branch, of which Mrs. Stuart Michaux is president, gave a tea dance to the freshman class of the Medical College of Virginia. It is planned to make this an annual event, so as to give the newcomers a chance to meet some Richmond people and make some social contacts outside the college. The tea was largely attended and was a great success.

Mrs. Fletcher Wright, of Petersburg, Chairman of Organization, has written to those ladies who gave their names at the Danville meeting and expressed a desire to organize. Any others who are interested will please send their names and addresses to Mrs. Wright and she will tell them how to go to work, and if possible go in person to help them get started.

The American Medical Association has collected a number of health films which are available for those auxiliaries that wish to put on a health programme in the counties. Information concerning these films may be had by writing Mrs. J. Allison Hodges, Cary Street Road, Richmond, Virginia.

Proceedings of Societies

The University of Virginia Medical Society.

This Society met on Monday, November 4th, at the Hospital. Dr. Bray presided.

Dr. Dudley Smith exhibited a case of Xeroderma Pigmentosa, and described the lesions with cancer formation in the skin and the treatment with radiation. In the discussion, Dr. Bray described the microscopic sections from a great fungating cancer of the nose on this patient which is now receding under radiation.

Dr. Richard Meade described a case of actinomycosis now under observation with a prolonged history beginning apparently with a cryptogenic infection in the jaw and presenting obscure empyema and abscesses in the loose tissue and only at a later date giving the characteristic sulphur granules.

Dr. Brumfield exhibited recent autopsy material from a case of fibrous myocarditis with brown atrophy and sudden death. The rather incomplete evidence as to the cause of sudden death in this case was reviewed and microsections were projected.

Dr. Graham exhibited recent autopsy tissues from an unusual case of cancer of the rectum with protracted, almost complete obstruction. The cancer exhibited a sharply localized annular ring with no evidence of extension to adjacent regions, lymph nodes, or liver. There was an enormous hypertrophy of the large intestine above the structure resembling that of megacolon, and below the structure the lower six or eight inches of rectum was greatly distended but atrophic. A micro-projection showing the adecarcinoma was shown. Dr. Meade discussed the case, describing the gigantic distention of the colon at emergency operation for obstruction. Dr. Marshall discussed the diagnosis and the features that suggested the picture of non-specific ulceration of the rectum.

The main paper of the evening was a presentation by Dr. Lehman of experimental work upon fat embolism (paper to be published elsewhere).

The next meeting will be held at the University Hospital, November 19th.

The Truth About Medicine

In addition to the articles enumerated in our letter of September 28th, the following have been accepted:

Abbott Laboratories
Capsules Ephedrine Hydrochloride—Abbott, ⅜ grain.
Lederle Antitoxin Laboratories
Tablets Whole Ovary—Lederle, 2½ grains.
Eli Lilly & Co.
Antimeningococcic Serum Concentrated—Lilly.
Antistreptococcic Serum, Purified and Concentrated (Lilly).
Mallinckrodt Chemical Works
Iso-Iodeikon.
Merck & Co., Inc.
Optochin Base.
Optochin Hydrochloride.
H. K. Mulford Co.
Mulford's Acidophilus Bacillus Blocks.
Tetanus Antitoxin (Bovine).
Parke, Davis & Co.
Capsules Ephedrine Sulphate—P. D. & Co., ⅜ grain.
Capsules Ovarian Substance, Desiccated—P. D. & Co., 5 grains.
E. R. Squibb & Sons
Tablets Protargentum—Squibb, 4.6 grains.
Tablets—Solargentum—Squibb, 4.6 grains.
Swan-Myers Co.
Syrup Ephedrine Hydrochloride (Double Strength)—Swan-Myers.
Nonproprietary Articles
Ethylhydrocupreine.
Phentetiothalein Sodium.

NEW AND NON-OFFICIAL REMEDIES.

Diphtheria Toxin-Antitoxin Mixture.—The antitoxin used in the toxin-antitoxin mixture (New and Non-official Remedies, 1928, p. 366), is produced from the horse, goat or sheep.

Diphtheria Toxin-Antitoxin Mixture (New Formula) (Sheep)—Squibb.—Each cubic centimeter represents 0.1 L+ dose of diphtheria toxin neutralized with the required amount of antitoxin obtained from the sheep. Marketed in packages of three ampules, each ampule containing 1 c.c. of the mixture; in vials containing, respectively, 10, 20 and 30 c.c., and in packages of thirty 1 c.c. ampules. E. R. Squibb & Sons, New York.

Parathyroid Hormone—Squibb.—A stable aqueous solution containing the active principle or principles of the bovine parathyroid glands and having the property of relieving the symptoms of parathyroid tetany and of increasing the calcium content of the blood serum. It is standardized physiologically. Parathyroid Hormone-Squibb is claimed to be specific for normal or parathyroidectomized man when injected subcutaneously for increasing the level of the blood serum calcium. It is marketed in 5 c.c. vials. E. R. Squibb & Sons, New York.

Tetanus Antitoxin.—This tetanus antitoxin, concentrated (New and Non-official Remedies, 1928, p. 356), is also marketed in a syringe containing 20,000 units. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., October 13, 1928, p. 1109).

Diphtheria Toxin for the Schick Test.—This diphtheria immunity test (New and Non-official Remedies, 1928, p. 291), is also marketed in packages of two 10 c.c. vials, sufficient for 100 test doses. Schick Test Control is also supplied in packages of one 10 c.c. vial, sufficient for at least 100 tests. H. K. Mulford Co., Philadelphia.

Tetanus Antitoxin Globulin.—This tetanus antitoxin, concentrated (New and Non-official Remedies, 1928, p. 356), is also marketed in piston syringe containers, containing 20,000 units. Parke, Davis & Co., Detroit.

Diphtheria Toxin-Antitoxin Mixture 0.1 L+ (Non-Sensitizing).—Each c.c. constitutes a single dose of diphtheria toxin neutralized with the proper amount of antitoxin produced from goats (New and Non-official Remedies, 1928, p. 366, and *The Journal*, October 13, 1928, p. 1109). It is marketed in packages of three vials, each containing 1 c.c.; in packages of one vial containing 10 c.c., and in packages of one vial containing 30 c.c. United States Standard Products Co., Woodward, Wis. (Jour. A. M. A., October 20, 1928, p. 1193).

PROPAGANDA FOR REFORM

Barbital and Related Hypnotics.—Many substitutes for barbital have been introduced with the claim of greater relative hypnotic action as compared with toxic effects. The toxic action appears to be mainly an intensification of the depression of the central nervous system which in therapeutic doses produces nearly normal sleep; hence their hypnotic activity and their toxicity must run closely parallel, so far as the central nervous system is concerned. An experimental study of a number of hypnotics of the barbital series on cats showed that none were much more actively hypnotic in proportion to their toxicity than barbital. Of the five hypnotics examined, none exerted marked analgesic effects with less than 30 per cent of the average fatal dose. None of the hypnotics produced any uniform change in the heart rate or respiratory rate. From this study one does not gain the impression that any of the substitutes possesses all the advantages and none of the disadvantages of the official barbital. Probably the actual toxicity for man is nearly proportional to the hypnotic action. (Jour. A. M. A., August 11, 1928, p. 398).

"Denicotinized" Tobacco.—So-called denicotinized tobaccos and tobacco products for which reduced nicotine content is claimed or implied by label declaration are now being offered for sale. Some of these are claimed to be "absolutely harmless." The Connecticut Agricultural Experiment Station has published a report on denicotinized tobaccos which shows that the nicotine content of these products varies considerably just as in the case of ordinary tobaccos. As a group, they were found to contain somewhat less nicotine than tobacco. Some "denicotinized" products on sale contained as much nicotine as is likely to be found in ordinary tobaccos; a few contained substantially less. None of the "denicotinized" tobaccos examined are sufficiently poor in nicotine to warrant unrestricted indulgence on the part of consumers who suffer ill effects from this alkaloid. It is pointed out that the consumer of "denicotinized" tobacco products may consume larger quantities than of the ordinary product, partly because he believes it to be largely or entirely freed from its objectionable nicotine, and partly in an unconscious effort to secure the satisfying effects he is accustomed to derive. Consequently his actual nicotine intake may equal or exceed his usual con-

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sumption. (Jour. A. M. A., August 18, 1928, p. 501; August 25, 1928, p. 583).

The Action of Glycerophosphates.—The general consensus of critical opinion is that the theory under which the glycerophosphates were introduced into medicine is fallacious and that they are useless as tonics. Whatever effects are observed from the mixtures in which these salts are generally buried, may be safely abscribed to the other ingredients. (Jour. A. M. B. A., August 18, 1928, p. 515).

Treatment of Tapeworm in a Child.—To children, oleoresin of aspidum may be prescribed in doses of 0.5 Gm. per year of age but not exceeding a maximum dose of 5 Gm. The preparation should include saline catharsis for several days previously, light diet for the day before, and a liberal dose of magnesium sulphate (from 5 to 10 Gm.) and an evacuent enema the evening before the treatment. (Jour. A. M. A., August 25, 1928, p. 584).

Tuberculin.—Investigation at the Otho S. A. Sprague Memorial Institute at the University of Chicago makes it evident that the water-soluble protein in tuberculin is similar in many of its properties to ovalbumin. These studies have resulted in the isolation of the active principle of tuberculin in crystalline form. (Jour. A. M. A., September 1, 1928, p. 648).

Caffein in Beverages.—The report of the U. S. Department of Agriculture indicates that, despite continued growth in population, nearly six and one-half million pounds less tea was imported during the fiscal year ending June 30, 1928, than during the previous year. This represents a decrease of 7 per cent. In contrast with this is the governmental announcement that caffein-containing drinks other than tea and coffee are now being used extensively with meals at lunch counters, cafeterias and similar eating places. Those who have hopefully anticipated a decrease in the "caffeinization" of the nation will be further disconcerted by the information that of several million pounds of tea waste, tea siftings and tea sweepings which have been imported "for manufacturing purposes" practically all are reported to be converted into caffein, a large portion of which is used in the preparation of caffeinated soft drinks. (Jour. A. M. A., September 1, 1928, p. 649).

Arsamine.—According to the advertising for "Arsamine" of S. Lewis Summers, this preparation is "diarylarsonate", but no definite statement of composition is made. It is believed that a constantly increasing number of physicians are refraining from the use of proprietary medicinal articles which have not been reported on favorably by the Council on Pharmacy and Chemistry. This is in accordance with the report of the Board of Trustees of the American Medical Association to the House of Delegates in 1927 urging support of the work of the Council by confirming the use of proprietary drugs to those found acceptable for inclusion in New and Nonofficial Remedies. The claims that have been made by Dr. S. Lewis Summers for Befsal which were the subject of a report "Befsal Another Alleged Synthetic" (Jour. A. M. A., February 21, 1925, p. 611) constitute ample justification for questioning the claims made for Arsamine. (Jour. A. M. A., September 1, 1928, p. 664).

The Investigation of Germicides.—J. S. Simmons has studied the bactericidal action of mercurochrome —220 soluble and iodine solutions in skin disinfection and F. E. Rodriguez has studied the action of mercurochrome and iodine as disinfectants of the mucous membrane of the mouth. After taking swabs of the treated areas, they streaked the material directly, without previous dilution, on the surface of an agar plate. This procedure, it is agreed will give inhibitory effects and may be an unfair test, because no two drugs have exactly the same inhibitory index. It has been found that iodine has a higher inhibitory effect than mercurochrome and it seems likely that the amount of iodine carried over to the plates might have been sufficient to inhibit growth of the bacteria without being bactericidal. G. F. Reddish and W. E. Drake studied the action of mercurochrome—220 soluble and U. S. P. tincture of iodine as to comparative germicidal efficiency. These investigators used scrapings from the skin surface in a way to considerably dilute any antiseptic that may be present. They made controls to prove that no drug inhibition took place in their tests. In other respects the work of Simmons and Rodriguez introduced errors which Reddish and Drake tried to avoid. However, whatever the final results of laboratory experiments may be, reliance should not be placed solely on such results; clinical observations must be considered. (Jour. A. M. A., September 8, 1928, p. 728).

The Prevention and Modification of Measles.—Two years ago it was announced that protection was secured in 85 per cent or more of susceptible persons exposed when convalescent measles serum was administered before the fifth day after exposure to measles and that in some cases the disease was modified when the serum was given as late as the seventh day. It has been attempted to produce a serum from animals by using the diplococcus isolated from patients with measles. Results have been reported from the use of such a serum developed in horses; but the production of immune goat serum seems even more promising. It is to be remembered, however, that the protection thus conferred is only transient. Active immunization with a toxin prepared from the causative organism of measles remains to be successfully accomplished. In Chicago a committee has concluded that as a general practice it is doubtful whether the immunization of all children exposed to measles is desirable. (Jour. A. M. A., September 15, 1928, p. 803).

Book Announcements

The Medical Record Visiting List, or Physicians' Diary for 1929. Revised. New York. William Wood & Company. Medical Publishers. 30-patient daily record, with various tables and much information of value to the physician in his every-day work. Pocket size. Leather, with inside pocket and pencil. Price, $2.00. Orders should be sent direct to publishers.

National Health Council Film List, Including Information on Visual Aids and Their Producers and Distributors. Fifth Edition. 1928. Prepared and printed by Welfare Division, Metropolitan Life Insurance Company. Home Office, New York. 178 pages. Paper.

Committee on Public Health Relations. Report of Activities for the Year 1927. The New York Academy of Medicine, Fifth Avenue and 103rd Street, New York City. Pamphlet of 31 pages.

Pamphlets of the Policyholders Service Bureau, Metropolitan Life Insurance Company, Home Office, New York. **The Use of Style and Design in Industry,** 44 pages. **Business Organization No. 12—Functions of the Production Executive,** 26 pages and table.

Virginia Medical Monthly

FOUNDED BY LANDON B. EDWARDS, M. D., APRIL, 1874.
OWNED BY THE MEDICAL SOCIETY OF VIRGINIA.
PUBLISHED BY THE PUBLISHING COMMITTEE.

A. G. BROWN, JR., M. D., Chairman and Editor, Richmond, Va.

A. L. GRAY, M. D., Richmond, Va.
J. H. NEFF, M. D., University, Va.

AGNES V. EDWARDS, Business Manager and Secretary-Treasurer.

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal, 104½ West Grace Street, Richmond, Va.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance.
Single Copies 20c.

VOL. 55 DECEMBER, 1928 No. 9

Editorial

Malaria and Sir Ronald Ross.

The place that malaria, as a disease, has occupied in the history of the progress of civilization and the physical fitness of the human race has been a large one. War and pestilence have probably held as important positions as deterrents in the progress of human life and health, but, as a slow persistent and ever-recurring deterrent of health and happiness, especially in the zones of the world where marsh land and temperate climate have favored the propagation of the mosquito, malaria has stood out as a blighting scourge in all generations of man.

Through Europe, including England, Asia Minor, Burma, the Straits Settlements, Java, China, Formosa, Egypt; west, south and central Africa, Australia, South America, West Indies; and the United States, malaria has for unrecorded generations wrought its deadly effects on the inhabitants. With seasonal periodicity, the paludal disseminator of malaria, has risen through the years to inoculate and cripple the bodies of men, women and children. No one knows for how long the miserable sway of this disease has had dominion over the happiness and welfare of the human race of these countries. No one with the greatest stretch of the imagination could fully picture the unutterable miseries suffered by peoples of Southern climates the world over, in both its acute paroxysmal symptomatology and its chronic recurrent pathological changes that combine to visit upon every tissue and organ of the body malignant processes of all sorts and types. While the mortality of the immediate attack of malaria served as a rather small indictment of the disease, the fatalities of the disease have been enormous from the chronic pathology that its persistent recurrence in the body of man has occasioned.

So probably no disease has a truer claim to consideration as an historic menace to man in all his works through life than malaria.

In our Southern states we know malaria has been a large menacing economic and health problem for generations. No man can sum up the addition of its baneful effect upon commercial, social, and physical welfare of our Southern people. For malaria, in its acute symptomatology and in its chronic forms, throughout the three hundred years of American history, has been a hindrance to the success and a danger to the health of our people. Even within recent decades, since the discovery of the true nature of the malady, its etiologic cause and environmental propagation and its specific means of transplantation from man to man, malaria has persisted its menacing influence on the welfare of the people of our section of the country. While states south of us have, no doubt, suffered more seriously from the malignant action of this disease, Virginia, in regions contiguous to its broad water-courses and bay-country, has been a victim of the untoward effect of its periodic seasonal recrudescence. Throughout her colonial history, from the settlement at Jamestown to the Revolution, this disease played a grievous part in retarding the happiness and the health of Southern people. Throughout the Civil War, in both armies about bivouacs in the low country-side of Virginia, malaria, laid low with chills and fever many a soldier, and left many a veteran handicapped for life.

So it has come in post-war times, not so much as before, a problem of preventive medicine, an important health problem. Even today, if measures are not taken for its prevention, malaria may figure in no inconsiderable degree in the pathology of the people, if not in this State, in the more Southern states, particularly in that region about the Mississippi delta country.

History of Discovery of Causation of Malaria

From the time of Hippocrates, the cause of malaria (ague, fever and ague, chills and fever, marsh fever, swamp fever, paludal fever, miasmatic fever, remittent fever, pernicious fever,

bilious fever) has been sought for. Various more or less fanciful theories have been given by various ages of medical practitioners and students of malaria. But it remained for workers in the closing years of the nineteenth century to make the necessary discoveries. The true nature of this age-long human malady was discovered by a series of advances in research investigation of its microscopic parasite in the blood of the human and the means of the germ transplantation from man to man by the bites of certain species of mosquito. The steps of discovery by which this great advance in human knowledge occurred have become a big chapter in the history of modern medical achievement and scientific progress. The first notable contribution was made by Laveran, a French army surgeon, in 1880. In November of that year, Laveran plainly saw living parasites, by aid of the microscope, in a specimen of blood of a malarial patient, and he afterward communicated this astonishing discovery to the Academy of Medicine in Paris. Like many other discoveries, much doubt greeted his announcement. But in 1885 Italian pathologists, having accepted Laveran's statement, began to work over the next important advance: the life history of the malarial parasite. Italy, for centuries having been devastated by malaria, eagerly gave valuable research contributions to the knowledge of malaria. Italian pathologists in due time established the nature of the parasite; its behavior in the blood; its periodical febrile paroxysm resulting from developmental changes in the parasite; the identification of the relationship of the different forms of malarial fever to the aestivo-autumnal group.

But the origin of this parasite; and its ways; and its mode of introduction into the blood were yet unknown. For a time suggestions of the possible relation of the marsh mosquito with the parasite and its introduction by this insect into the human body were made. In 1894, Sir Patrick Manson, more emphatic than others, impressed the suggestion that the mosquito formed the intermediate host, but this important step as a means of propagation of malaria was not proved until the following year.

Major Ronald Ross

In 1895, Ronald Ross made the big discovery that showed malaria in its true colors. Ross found that if a mosquito sucked blood containing malarial parasites, flagellae were soon formed and that these broke away and became free. In 1897 he discovered peculiar pigmented cells, which were parasites of aestivo-autumnal malaria in the early stage of development in the stomach of the mosquito. Ross further proved that only mosquitoes of the genus anopheles had these cells. He showed that the mosquitoes did not have them when feeding on healthy blood, but did when fed on malarial patients' blood. Ross then worked out the life history of the parasite within the body of the mosquito.

As a benefactor of the human race this man has received meager reward. It is true that his country no longer calls him major, but Sir Ronald Ross—but he is now 71 and in declining health. He is now brought face to face with the necessity to sell for $10,000 the archives that tell of this epochal work at his hands. Sir Ronald Ross in his old age, appears to be in failing health and in want of physical comforts, while the fact of his scientific study has enabled untold thousands of his fellow beings to be protected from the ravages of a devastating malady. Consciousness of a heroic position in the ranks of the world's benefactors is indeed compensation, but is it not a queer turn of destiny that want and poverty should threaten the body of one who has done so much for the bodily comfort of his fellow men?

The London letter, found in the J. A. M. A., November 17, 1928, page 1560, tells the lamentable story of Sir Ronald Ross' present plight.

In an interview, the following intimate picture of the details of his discovery are given by himself. In 1897 he was in the Indian Service. For years he had been trying to cultivate malarial parasites in patients. August 20th, he was on military duty and had been working all morning in his regimental hospital in the hottest weather. He went home, tired and exhausted from the heat. He laid down and fell asleep. When he awoke, the key to the problem seemed to come to him. He followed up the thought and proved that the anopheles mosquito carried malarial germs in its stomach. For a year he worked and brought forward the new facts. He says: "For fifty years I have been talking to politicians and others with the idea of getting them to take some interest

in the preservation of human life. They seem to have forgotten that malaria kills more people than any other disease, and that for every million it kills it renders two hundred million sick every year. It causes one-third of the sickness in India."

An Appeal for Medical Folklore.

Members of the Medical Society of Virginia, who may have knowledge of beliefs of diseases and folklore remedies of the past, will materially assist the Committee on History of Medicine in Virginia of our State Society, if they will reduce to writing any of these and send same to Dr. Wyndham B. Blanton, Richmond, Chairman. Since the special circular sent with the November number of THE VIRGINIA MEDICAL MONTHLY, some responses to the request have been received, but it is certain that much remains to be unearthed and to be put into writing. It is hoped that members will take interest in the collection of this material in old Virginia, which has long since been permitted to remain a matter of word of mouth.

Folk medicine is a chapter of medical history rich in interest, if not in scientific value, and it should be preserved in writing if possible.

In old days on the Virginia plantations, and in rural communities, in remote sections of the State, among the slaves and negro "grannies," there developed a sort of medical practice that passed by word of mouth from one to another through the years. These "old sayings" and trifling medical folklore merit collection and recording before time and lack of a need for such in modern life cause them to be lost. Physicians have heard many of these "beliefs" and "practices" and it is only necessary to take the time to reduce the same to writing and to forward them to the committee on history.

Remember Your Advertisers.

It is well, once in a while, to take note of our assets. Every member of the Medical Society of Virginia is part owner of the MONTHLY and should be interested in its success. One of our greatest assets is the high class advertising in our pages, for the journal is in large measure supported by its advertisers. Many advertisers have something for our readers—just for the asking. They key advertisements so as to trace results and are encouraged to renew contracts when readers manifest an interest. You may secure much that is worth while and our advertisers will be pleased if you will look over the advertising pages each month and write for samples and literature which will be sent on request. Don't fail to say that you saw the advertisement in THE VIRGINIA MEDICAL MONTHLY.

News Notes

We extend to our readers the Season's Greetings and Best Wishes for Christmas and the New Year

Prize Winners in Danville Golf Tournament.

In publishing our notice of the Danville meeting of the State Society, we had not been advised of names of winners in the golf tournament. This accounted for our failure to mention this event, which was of great interest to many of our members.

Dr. Robert C. Bryan, Richmond, with the lowest score—92—won the cup donated by the local society. Other prizes, donated by the Danville merchants, were awarded as follows: Dr. John Bell Williams, Richmond, pen; Dr. John S. Horsley, Jr., Richmond, golf club; Dr. Richard W. Fowlkes, Richmond, golf hose; Dr. Paul W. Howle, Richmond, golf balls; Dr. W. L. Harris, Norfolk, cigars; Dr. Stuart Michaux, Richmond, golf bag; Dr. W. B. McIlwaine, Petersburg, hypodermic case; and Dr. J. Blair Fitts, Richmond, searchlight.

The Story of the Chrismas Seal.

Every year millions of Christmas seals are sold in this country to control and prevent tuberculosis. They have become a symbol of the great war that is being waged against an ancient, preventable disease. But in 1904 the Christmas seal originated in a small way to give a chance for health to a group of tuberculous children in a foreign country.

In that year a children's hospital was needed in Copenhagen, Denmark. A postal clerk in that city named Einar Holboell heard of this and conceived the idea that stamps, especially designed to decorate Christmas letters and packages, could be made to finance the cost of the building. His enthusiasm won for him the endorsement of the Danish royal family, and the first Christmas seal was designed and placed on sale in the post offices. The good citizens of Denmark purchased enough of them to insure for the sick children the best medical and nursing care available.

A pioneer in the field of social service in America received a letter from his mother country bearing one of the bright-colored little

stamps. His name was Jacob Riis and, his curiosity aroused by this new decoration, he inquired about its purpose. The possibilities of its use in the United States impressed him. He wrote an article that was published in the "*Outlook*" in which he described what the stamp had achieved in Denmark.

In that article, Miss Emily P. Bissell, of Wilmington, Delaware, found the solution of her own problem; namely, how to raise $3,000 for a tuberculosis pavilion in her state. She organized the first sale of Christmas seals in the United States and as a result the pavilion was built. In 1908, Miss Bissell was able to induce the authorities of the American Red Cross to undertake a nation-wide sale of tuberculosis Christmas stamps. Women's clubs, religious bodies and local Red Cross chapters assisted in the campaign. From then on until 1920 the Red Cross conducted the sale of the seals.

From 1907 to 1910 the National Tuberculosis Association had been organizing its warfare against the disease with the support of foremost scientists, but with little funds. To strengthen the organization's work, the American Red Cross joined with it in the Christmas seal sale. The partnership between these two great welfare bodies lasted for ten years. Then, in 1920, it was dissolved because the American Red Cross desired to continue its annual Roll Call, begun in the years of the Great War, and it did not wish to appeal to the public for funds twice a year. Since that time only the double-barred cross, emblem of the tuberculosis movement, has appeared on Christmas seals.

Through the power of the Christmas seal, state after state was gradually organized to attack tuberculosis with a scientific program. The state organizations entered the larger cities and counties and formed local associations. Together, led by the National body, they have brought into existence nearly all of the present-day community machinery for combating tuberculosis.

The little stamps help to control the sources of infection especially to children, to educate everyone in health habits and to prevent economic loss due to the death of producers. This year the National Tuberculosis Association and its affiliated organizations will hold the twenty-first sale of Christmas seals throughout the country.

The above story was supplied by the National Tuberculosis Association.

Ephedra Picking—China Famine Relief Work.

Chinese in the famine regions pick a medicinal herb by the roadsides in return for food. The herb, called ephedra (*ma huang*, in Chinese), has of recent years been employed considerably by foreign druggists for making *ephedrin*, a drug indicated for asthma and bronchial complaints. In co-operation with the Peking Union Medical College, the Mosse Memorial Hospital, the North China Diocesan Relief Fund, and other institutions, the China International Famine Relief Commission has adopted the herb-picking scheme of "labor relief" and it is proving helpful.

According to the Peking and Tientsin *Times*, "The herb, which grows wild by the roadside, and in the mountains, is akin to the yew tree and has a pleasant aromatic smell. The relief work consists in engaging the villagers of the district to bring in, for a price somewhat above what the very small local market offers, loads and loads of this *ma huang*. Last year's purchase justified the scheme as non-pauperizing and self-supporting.

"This year 200 tons of the herb were brought in, and that amount practically exhausted the supply within a radius of twenty miles, which is about the limit of the distance which it pays men to transport the herb.

"To see the villagers bringing in their daily cuttings was to make a study in transport. Men's backs and carrying poles, big two-men barrows and little ones, carts large and small, donkeys, cows and camels, all crowded round the gates waiting admission. When the gates were opened, it needed no little organization, and no less use of vocal organs, to sort out the line-up for the weighing of loads, carts in one place, beasts in another, and men separately. Drying, stacking and packing for export were all accomplished by famine labor."

The present is the third consecutive hard year in Shansi province, and the herb picking serves as timely relief.

Good Work of the Carville, La., Leprosarium.

In spite of the fact that the treatment of leprosy is tedious, it is stated that during the past sixteen months, twenty-four patients have been discharged from the National Leper Home

at Carville, La., as recovered or "arrested". It is a matter of interest to note that the Public Health Service has devised a painless method of administering the injections of chaulmoogra oil by mixing a harmless anesthetic with each dose. This is a boon to the patients, many of whom found the injections week after week for months and years quite painful.

Dr. J. Frank Folk,

Of the class of '26, Medical College of Virginia, is now located at Warrenton, Va., where he is associated with Dr. John L. Thornton in doing general practice.

The American Academy of Ophthalmology and Oto-Laryngology.

At its annual meeting in St. Louis, Mo., the middle of October, elected Dr. William H. Wilder, of Chicago, president-elect; Dr. William P. Wherry, Omaha, Nebr., executive secretary; and Dr. Secord H. Large, Cleveland, O., treasurer. Dr. Harris P. Mosher, Boston, succeeded to the presidency. The 1929 meeting will be held at Atlantic City, N. J.

Dr. and Mrs. Joseph Bear

Returned to their home in Richmond, Va., the middle of November, after a motor trip of sometime to Chicago, Detroit, Canada and Buffalo. While in Chicago, Dr. Bear spent sometime at the Chicago Lying-In Hospital doing post-graduate study. He also attended special clinics in Buffalo while away.

Children and the "Movies".

How important is the question of children attending the "movies"? Rather so, because of the enormous number attending. In Los Angeles it was found that 60,000 children under the age of twelve were going to the picture shows every week, and in a large group of school children in Kansas, a typically rural State, nearly half of the eight-year-old children and two-thirds of the fourteen-year-olds went once a week or oftener. These facts indicate the need for regulating indiscriminate attendance by children, for higher standards in the matter of pictures on the part of parents and the general public, and for the cessation of the habit of parking unattended children at the moving-picture theaters, which some parents seem to find an easy way to assure themselves an evening for their own amusement purposes free from responsibility for their offspring.

Dr. Beverley F. Eckles

Recently resigned as one of the general surgeons on the staff of the McGuire Clinic, Richmond, Va., to accept the position as chief of the surgical department of the Galax Hospital at Galax, Va. Prior to entering upon his new duties on November the 15th, Dr. Eckles took a post-graduate course in the surgical specialties in New York City.

Southern Medical Association.

The twenty-second annual meeting of this Association was held in Asheville, N. C., in November, under the presidency of Dr. William R. Bathurst, of Little Rock, Ark. One of the most important business matters before this meeting was a discussion as to the purchase of a permanent home in Birmingham, Ala., and a committee was appointed to look after this. Miami, Fla., was selected as the 1929 meeting place and the following officers elected: President, Dr. Thomas W. Moore, Huntington, W. Va.; vice-presidents, Drs. Paul H. Ringer, Asheville, N. C., Edward C. Ellett, Memphis, Tenn., and Felix J. Underwood, Jackson, Miss. Mr. C. P. Loranz continues as secretary-manager and Dr. M. Y. Dabney as editor of the journal.

Conference of State Secretaries.

Secretaries of the constituent state medical associations of the American Medical Association met in Chicago, November 16 and 17, as guests of the Association, for their annual conference. Dr. Thos. B. Throckmorton, of Iowa, was selected as chairman for the three sessions.

Talks were made to the state secretaries and editors by officers of the Association and several specially prepared papers were presented on subjects of interest to these officers. The discussions which followed the papers showed that all state organizations have many problems in common. On the afternoon of the first day, the "Harvey Film" on the circulation of the blood was shown and it was stated that this would be loaned to state or local societies upon request.

The State Colony for Epileptics and Feebleminded,

At Colony, Va., has recently issued its nineteenth annual report for the fiscal year ending June 30, 1928. This states that during that year, the institution was constantly crowded to the extreme limit of its capacity. However, a new dormitory for males is to be constructed which will have space for 177 beds and this addition, when completed, will relieve the congestion in the male department.

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During the year, 115 patients received training in the academic and industrial departments of the Colony school and were much benefited by these opportunities for development which had hitherto not been afforded them. A number of patients entered as illiterates learned to read and write very creditably, and many other patients were given useful instruction and interesting employment in various sorts of handcraft. Outside of the school proper, several hundreds have received the benefit of occupational therapy by employment in the various departments of the institution.

Dr. Walter B. Martin,

Norfolk, Va., who was prevented by personal illness from attending the Danville meeting of the State Society and opening discussion on the symposium on "The Anemias" as listed on the program, is now much improved.

A Correction.

In the September issue of the MONTHLY, we published an editorial on "Our Centenarian Medical Schools". Recently we were advised that Dartmouth Medical School, Hanover, New Hampshire, should have been included in this list as it this year commenced its one hundred and thirty-second session.

We regret the omission of this college in the above mentioned editorial and are glad to note there is another school in the United States entitled to be included with "Our Centenarian Medical Schools".

Dr. J. Shelton Horsley,

Richmond, Va., by invitation, read a paper in the scientific program of the Medical Society of the County of Kings, at its regular meeting in New York, November the 20th, his subject being "The Influence of Physiologic Research on Modern Surgery."

Dental Clinics of Greater New York.

In one district alone of Greater New York there are said to be 20,000 school children whose teeth have been examined but who are waiting for the needed dental care. The dental services available at moderate cost for children and adults in that city have been found to be inadequate, although the city boasts 516 dental chairs in actual use in 152 public and private clinics. One reason for this inadequacy is that the equipment has been used less than half the time because of lack of available funds to pay dentists.

Dr. O. C. Page,

Formerly of Brodnax, Va., is now located at Hopewell, Va., where he is engaged in the practice of his profession.

Dr. Paul W. Howle,

Richmond, has been elected one of the new directors of the Country Club of Virginia.

The Golden Rod Slip.

In this issue of the MONTHLY, members of tht Medical Society of Virginia will find a golden rod slip. If used by them in place of bills, it will save the Society financially and also give the office force time which may be used for other purposes.

Members who have already paid for 1929 should ignore this slip.

Medical Profession of Western Hemisphere to Congress in Havana.

The next congress of the Pan-American Medical Association will be held in Havana, Cuba, from December 29, 1928, to January 3, 1929. The program, which is being arranged by the President, Dr. Fred H. Albee, of New York City, will be a strong one, and will include four orations, upon the subjects of surgery, medicine, pediatrics, and tropical medicine.

Dr. William J. Mayo will give the Oration on Surgery, and Dr. Lewellys Barker, of Johns Hopkins University, the Oration on Medicine. Papers will be read in both Spanish and English.

This congress will be representative of the medical profession of the entire Western Hemisphere. Chapters of the Association have been and are being organized in various centers of North America and Central America, as well as in the Antilles, all of which will be represented at the Congress.

One of the recent accomplishments of the Pan-American Medical Association is the establishment of the Pan-American Hospital in New York City for the benefit of the Latin-speaking people.

A large attendance is solicited.

Select Physician for Your Patients Travelling Abroad.

With rare exceptions hotels in Europe refuse to give the address of American or English doctors, endeavoring always to have the hotel doctor employed, who they claim speaks English perfectly. When this doctor arrives, if he speaks English at all, it is usually so poorly that the patient does not fully understand him and he feels that the doctor has not

fully understood what has been said to him, and consequently is irritated and alarmed and his trouble aggravated.

To overcome this boycott, the "Continental Anglo-American Medical Society" was organized in 1885 and in 1889 commenced the publication of a list of the Anglo-American doctors practicing in Continental Europe and Northern Africa; and wishing to establish the closest relations possible with their colleagues in America and England, will send a copy of this list, free of charge, to anyone applying to the Secretary, Dr. Sherwood-Dunn, 54 Bd. Victor-Hugo, Nice, France.

Dr. Julian H. Coleman,

Of the class of '25, University of Virginia, Department of Medicine, is now at the Mayo Foundation, Rochester, Minn.

Dr. Leland O. Mauldin,

Greenville, S. C., was a recent visitor in Richmond, having come on professional business.

The South Piedmont Medical Society

Held its regular semi-annual meeting in Lynchburg, Va., November 27th. In the absence of the president, Dr. W. R. Martin, of Charlotte C. H., the meeting was presided over by Dr. C. D. Barksdale, of Sutherlin, the first vice-president. Dr. George A. Stover, South Boston, was at the secretary's desk. Besides the subject of "Fractures," which was discussed at several angles, there were a number of other interesting papers by members and invited guests. Between the afternoon and evening sessions, the members enjoyed dinner at the Virginian Hotel, as guests of the Lynchburg and Campbell County Medical Society.

Dr. Wilkins J. Ozlin,

Of Dundas, Va., after a prolonged rest, is much improved and is now connected with the medical staff of Catawba Sanatorium, Va.

Tuberculous Children Who Show no Symptoms.

The Mayo Clinic at Rochester, Minn., gives a tuberculin test as a part of the routine examination of every child registered in it. Of 1,000 children six months to fifteen years of age, coming from communities of less than 25,000 population in thirty-five States, Porto Rico, Mexico, and Canada, who showed no evidence of active tubercular lesions, 169 gave positive reactions to the tuberculin test. Two-fifths of these children were underweight, and a small proportion were overweight. The percentage of girls reacting positively was considerably higher than that of boys, and the three cases found among children under two years of age were of girls. Known contact with the disease was reported for less than one-tenth of the 169 children, but family history of the disease was found for nearly one-fifth—a finding similar to that of comparable studies.

Have You Your Christmas Seals?

Eighteen million Christmas seals are being offered for sale in this State by the Virginia Tuberculosis Association,—enough to reach over three hundred miles if placed end to end, or from Richmond to the Kentucky border.

The seals have been distributed by the Virginia Tuberculosis Association to the county and city organizations of the State, and large groups of volunteer workers are busy with the sale of the seals which opened November 30th. In accordance with the agreement between the National Tuberculosis Association and the American Red Cross, the seals were not to be sold until the day after Thanksgiving, at which time the Red Cross Roll Call came to a close.

The office of the Virginia Tuberculosis Association, Atlantic Life Building, Richmond, is busy sending out additional orders as they are received, and answering the numbers of letters arriving by every mail.

Christmas seals pay for education, prevention and cure of tuberculosis.

Research Committee for Chicago World's Fair.

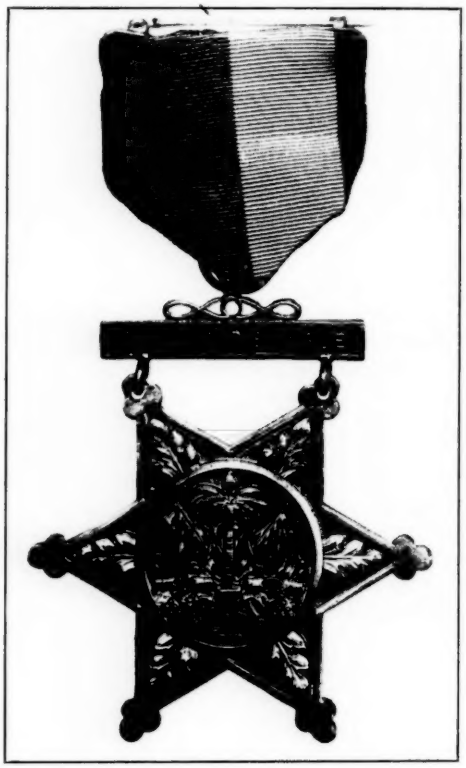
Dr. Max Mason, former president of the University of Chicago, Dr. William Allen Pusey, of Chicago, former president of the American Medical Association, Frank Baldwin Jewett, vice-president of the American Telephone and Telegraph Company, Gano Dunn, Dr. Simon Flexner, Dr. Vernon L. Kellogg, and Dr. Michael I. Pupin, have just been appointed as the National Research Council's Committee to co-operate with the officials of the Chicago World's Fair, to be held in 1933, in developing the scientific theme of the city's centennial celebration.

Commander Boland Honored.

Colonel Micajah Boland, for a number of years a member of the Medical Society of Virginia and known to many of our members, was awarded a medal and diploma by the President of Haiti in July, 1925, and their acceptance by Colonel Boland was authorized by an Act

of Congress approved by the President on the 28th of May, 1928.

We give herewith a photograph of the



"Medaille de Service Distingue", Republic of Haiti, and append a translation of the diploma.

BORNO

PRESIDENT OF THE REPUBLIC OF HAITI

TO ALL WHO SHALL SEE THESE PRESENTS

GREETINGS:

Be it known that the Distinguished Service Medal is presented to Colonel Micajah Boland of the Gendarmerie d' Haiti, who merits the following citation:

"He has directed the Medical Department of the Gendarmerie from 26 August, 1922, to 26 June, 1925, in remarkable and exceptional manner. He has maintained this service in a notable state of progress by his ability, his judgment and his efforts. He has greatly reduced the death rate of the Gendarmerie and likewise of the prisoners and the insane, all to the advantage of the service under his care, as indicated by the records. Research work of great importance, both to the medical profession and to the Gendarmerie, has been accomplished under his direction."

In testimony of which this diploma is presented to the said Colonel Micajah Boland for his service and valor, as is right.

BORNO.

We extend our congratulations to Colonel Boland on this honor.

Suicides vs. Homicides in Virginia.

The State Bureau of Vital Statistics, in a recent bulletin, states that while their statistics show the colored homicide rate in Virginia for 1927 (the killing is usually done by one of their own race) is three and a half times that of the white race, the condition is reversed with suicides, the white rate being more than four times the colored.

The Association of American Medical Colleges,

At its annual meeting in Indianapolis, elected Dr. Burton D. Myers, Bloomington, Ind., President, and re-elected Dr. Fred C. Zapffe, Chicago, Secretary.

Dr. S. B. Perry,

Hopewell, Va., recently tendered his resignation as coroner of that city that he might be reinstated to his place as a member of the City Council of Hopewell.

Dr. James M. Rogers,

Physician in charge of the Alexander Hospital, at Soonchun, Korea, the Southern Presbyterian Mission in Chosen, is now on a furlough in this country, visiting his former home at Amelia, Va. He made the return trip by way of the Panama Canal. In spite of his long distance from base, Dr. Rogers maintains his membership in the Medical Society of Virginia.

Playgrounds Decrease Delinquency.

A decrease of twenty per cent in twenty-five years in the number of juvenile delinquents in Milwaukee, Wis., although the population doubled during that time, has accompanied the spread of supervised playgrounds which the city started at the beginning of the period. In Dayton, Ohio, the sections of the city with adequate playground facilities show thirty per cent less delinquency than the districts which lack them. And a distinct decrease in court cases involving delinquent children has been reported as following the establishment of proper play facilities by 223 of 351 playground directors and superintendents of schools who replied to a questionnaire addressed to them by the magazine, *The American City*, published in New York City. The officials who did not report decreases were mostly from small towns where the delinquency problem is less acute.

An interesting development is increased use of playgrounds after nightfall as a means of luring children from the moral and physical hazards of the city streets at night.

Dr. Drewry Resigns as City Manager of Petersburg.

Following a change in personnel of the city council, and due to political influence, Dr. William F. Drewry, recently resigned as city manager of Petersburg, Va., after a service of five years. In noting his resignation, the Petersburg *Progress-Index* was most complimentary of the work done by Dr. Drewry in his official capacity, stating "We doubt whether any man could have been found who could have executed more skillfully the policy mapped out for him by the city council than has Dr. Drewry."

Dr. Drewry was, for a quarter of a century, superintendent of the Central State Hospital, Petersburg, and has achieved national distinction as an alienist. It is reported that he expects to re-enter actively the psychiatric field.

Periodic Health Examinations by the Family Physician.

According to *Hygeia*, North Carolina is the first state to create a unit of its Board of Health for the specific purpose of furthering periodic health examinations by family physicians. It is stated that this unit has a personnel of one doctor and one nurse who visit county medical societies, parent-teacher associations, civic clubs, colleges and ministers' associations to explain the value of such care.

This is a splendid work and other states would do wisely to follow suit.

Heads Southern Sanatorium Association.

Dr. Paul P. McCain, Sanatorium, N. C., medical director and superintendent of the North Carolina Sanatorium for the Treatment of Tuberculosis, at that place, has been elected to head the Southern Sanatorium Association for the coming year.

Dr. W. L. Devany

Has returned to his home at Dendron, Va., much improved, after undergoing a slight operation at a Richmond hospital.

Virginia Has a Traveling Mental Hygiene Clinic.

Virginia has recently started a traveling mental-hygiene clinic to serve the schools and medical and social agencies throughout the State, and to examine and treat delinquent children. Its staff includes a psychiatrist, a psychologist, and two psychiatric social workers. The Commonwealth Fund has contributed approximately $40,000 for the clinic.

Low Death Rates Among Certain Infants.

The low death rates found among infants insured in the Metropolitan Life Insurance Company by industrial wage-earning parents are ascribed by the company to the care given by its visiting nurses to insured prospective mothers and to acutely sick infants, and to the literature on the care and feeling of infants which it distributes to its industrial policyholders.

The Association of Surgeons of the Norfolk and Western Railway,

At its annual meeting in Cleveland, Ohio, this Fall, elected Dr. J. Francke Fox, of Bluefield, W. Va., president for the coming year; Dr. R. S. Griffith, Basic City, Va., first vice-president; Dr. W. C. Gibson, Suffolk, Va., second vice-president; and re-elected Dr. T. D. Armistead, Roanoke, Va., secretary-treasurer.

The Inter-State Post-Graduate Medical Association of North America.

Dr. John B. Deaver, Philadelphia, became president of this Association at its meeting in Atlanta, Ga., in October. Dr. William D. Haggard, Nashville, Tenn., was elected president-elect; Dr. William B. Peck, Freeport, Ill., managing director; and Dr. Edwin Henes, Jr., Milwaukee, Wis., executive secretary. Drs. William J. and Charles H. Mayo, Rochester, Minn., will be presidents of clinics.

Dr. Joseph Poland,

Of Atlantic City, N. J., has been elected president of the Atlantic County, N. J., Medical Society. He is a member of the staff of the Atlantic City Hospital, specializing in obstetrics, and is a graduate of Jefferson Medical College, class of 1907. Dr. Poland served his interneship in the Philadelphia General Hospital.

Assistant in Pediatrics, M. C. V.

Dr. Lee E. Sutton, a native Virginian, has returned to Richmond after a number of years spent elsewhere in study and work, and is connected with the Pediatric Department at the Medical College of Virginia. Dr. Sutton graduated from the Harvard Medical School, Boston, in 1921, and for the past two years has been an assistant in pediatrics at that school. He has also spent sometime studying his specialty in Vienna.

XUM

Foundation for Mental Health Organized.

The establishment of a new philanthropic foundation, known as The American Foundation for Mental Hygiene, Incorporated, was announced at the annual meeting of The National Committee for Mental Hygiene held in New York City, in November. This meeting was attended by over four hundred physicians, psychologists, educators, social workers and lay persons from various parts of the country.

Discussing the plans and scope of the Foundation, Mr. Clifford W. Beers, founder of the mental hygiene movement and Secretary of the National Committee for Mental Hygiene, stated that it is the first Foundation organized "for the exclusive purpose of financing and doing work that will enable men, women and children to live happier, healthier and more efficient lives through a better understanding and management of the processes of their minds and of the controlling forces in human behavior." Unlike most foundations created by persons of wealth interested in specific charities or other philanthropic projects which benefit from endowments immediately available, Mr. Beers said the American Foundation for Mental Hygiene comes into existence without an endowment of its own but with the confident hope of securing the funds necessary to carry out its purposes. The Foundation has already been made the beneficiary of a gift of $50,000 and has also a conditional pledge of $100,000 toward its first million dollars of endowment.

Dr. William H. Welch is honorary president; Dr. Arthur H. Ruggles, president, and Clifford W. Beers, 370 Seventh Avenue, New York City, secretary.

Married.

Dr. James M. Whitfield, Jr., Richmond, and Miss Charlotte Gibbs, Woodstock, Va., November 7.

Dr. John Cecil White, Richmond, and Miss Lucile Bass, in Washington, D. C., recently.

The Portland Meeting of the American Medical Association

Already gives promise of being largely attended, judging by the number of advance hotel reservations which have been made, although the meeting is not scheduled to be until July the 8th. The local committee is already making plans for this meeting and urges visiting members to stay over for the Saturday after the scientific sessions, that they may take some of the lovely trips to be had out from Portland.

Golfers will have all the accommodations they wish, as there are eight splendid private golf clubs and ten of the pay-as-you-play type.

Gorgas Health Calendar.

The Gorgas Memorial, 1331 G Street, Northwest, Washington, D. C., has issued the Gorgas Health Calendar, for sale at $2.50 each. Doctors are urged to secure these for their friends (or have them sent direct) as the modest profits derived from the sales will become a part of the Gorgas Memorial Endowment Fund.

The calendar for each day contains a health maxim by an outstanding man in medicine, philosopher or statesmen. The especially designed stand—size 7¼x4½ inches—is handsome, sturdily built, mahogany finish, equipped with rubber feet. This calendar is an appropriate holiday gift, and will be sent direct, prepaid, with your card enclosed when so ordered.

Orders should be sent above address promptly as only a limited number of these calendars is available.

Virginia Battles Against Diphtheria and Promotes General Child Health.

Since the beginning of 1927 the Virginia State Board of Health has immunized 250,000 children against diphtheria. In 1927 the State showed the lowest death rate from that disease in its history. There was a reduction of 18 per cent in the number of cases and of 38 per cent in the number of deaths from the record of the previous year, although in the United States as a whole there was a general increase in the incidence of the disease. Clinics for immunizing the children were held in the rural schools, local physicians and the State department of education co-operating with the staff of the board of health, to which additional physicians and nurses and a publicity agent had been appointed to carry out the campaign.

The board of health is also carrying out a general health campaign among school children, largely through arousing interest in winning the "five-point" certificates which it issues to every child who comes up to the board's standard in regard to teeth, weight, sight, hearing, tonsils and adenoids. One county has increased its number of five-pointers from 200 to more than 900 in a single year, and another

has more than 2,400. The State employs ten dentists who travel about among the rural schools with portable equipment, charging a nominal sum for their work. The State society of throat specialists has planned for the holding of tonsil clinics, and county nurses give much aid. Teachers are now required to qualify themselves for the physical inspection of their pupils and, according to the supervisor of school dentistry, they usually discover about 65 per cent of the teeth defects, which, he says, is "a whole lot better than nothing."

Dr. Mortimer H. Williams,

Of Roanoke, Va., has been in Europe since the early part of September, and is engaged in post-graduate work in diseases of the eye, ear, nose and throat at Vienna and Budapest.

Dr. Williams expects to return to this country some time in April, at which time he will resume his work in Roanoke.

Dr. L. H. Apperson,

Richmond, Va., has been appointed a surgeon to the Southern Railway, to succeed the late Dr. E. Govan Hill, with whom he was associated in practice.

Special Issue of American Medicine.

The November issue of *American Medicine* is a special "Food, Nutrition and Diet Number." This issue includes twenty-nine articles in three sections—Nutritional Factors, General Dietary Factors, and Diet in Disease. These articles have been written by invitation especially for the practical use of the busy practitioner and present a splendid idea of modern nutrition and diet.

Dr. William R. Martin,

Charlotte C. H., Va., has been in New York City, since October 1st, taking courses in pediatrics and internal medicine at the New York Post-Graduate Medical School and Hospital. He will also make observations at Dr. Polak's Clinic at the Long Island College Hospital, Brooklyn, N. Y., before returning home the 1st of January.

Other Virginians attending the Post-Graduate at this time are Drs. J. P. Trent, Farmville, W. R. Warriner, Crewe, and G. L. Morriss, Buckingham.

Food, Drug and Insecticide Administration Report.

The Food, Drug and Insecticide Administration has just submitted its report to the Secretary of Agriculture. This is the first annual report by the administration which was created in its present form July 1, 1927, to centralize and consolidate many of the regulatory functions entrusted to the Department, and to divorce these from the strictly research activities. This agency is responsible, among other things, for the enforcement of the food and drugs act. Under this act, the administration made 748 seizures and instituted 267 prosecutions in the year ending June 30, 1928. The largest group of seizures is listed under the headings of "remedies", drugs and drug products.

Dr. Andrew D. Hart,

Of the class of '27, University of Virginia, Department of Medicine, after interning at Jefferson Hospital, Roanoke, Va., has located in Charlottesville, Va., where he is engaged in general practice.

Dr. William I. Prichard

Has resumed his practice in Petersburg, Va., after a rest of some months during which time he has been recuperating from the results of an automobile and train collision.

Mortality From Automobile Accidents in 1927.

The Department of Commerce announces that in the registration area of continental United States (including only 91.3 per cent of its total population) there were 21,160 deaths in 1927 charged to automobiles and other motor vehicles (excluding motorcycles), and that the death rate from this cause was 19.5 per 100,000 population. This rate shows a steady increase each year. The deaths assigned to automobile accidents do not include those due to collisions of automobiles with street cars and with railroad trains. As in 1927 there were 476 deaths due to collisions of automobiles with street cars and 1,676 due to collisions with railroad trains, these would raise the number of deaths in automobile accidents to 23,312, or 21.5 per 100,000 population.

Dr. R. S. Faris,

Well known homeopathic physician of Richmond, Va., was elected president of the Southern Homeopathic Association at its meeting in Cincinnati, early in November.

New Zealand Leads the World in Saving Infants.

An article entitled "Infant Welfare in New Zealand," which describes the methods by which that British Colony brought about in 1927 the remarkably low infant mortality rate

of less than 39 per 1,000 live births, appears in the September, 1928, issue of *Hospital Social Service*, published in New York City. With this rate New Zealand leads the world.

The Post-Graduate Medical Society of Southern Virginia

Held a special meeting in Petersburg, Va., on the afternoon of November the 20th, at which time scientific papers were read by Drs. Alex. G. Brown, Jr., and Garnett Nelson, of Richmond, and Dr. Samuel Skillern, Jr., of the University of Pennsylvania, Philadelphia. Discussions on these papers were opened by Dr. S. W. Budd, of Richmond, and Dr. F. J. Wright, of Petersburg. After the scientific program, the members were entertained at the annual banquet of the Petersburg Medical Faculty, held at the Country Club.

On this occasion, the Petersburg Medical Faculty also elected the following officers for the ensuing year: President, Dr. E. W. Young; vice-president, Dr. W. B. McIlwaine; secretary-treasurer, Dr. John Harwood; and corresponding secretary, Dr. Ruth Mason.

New Secretary of the Post-Graduate Society.

At the regular meeting of the Post-Graduate Medical Society of Southern Virginia, held at Lawrenceville, Va., November the 13th, Dr. Philip Jacobson, Petersburg, was elected secretary, succeeding the late Dr. William C. Powell.

Civil Service Examination.

The U. S. Civil Service Commission, Washington, D. C., announces open competitive examination for medical adviser and assistant medical adviser to fill vacancies in the Food, Drug and Insecticide Administration, Department of Agriculture, for duty in Washington, D. C., or in the field. Applications must be on file with the Commission not later than December 29th.

Dr. Randolph McCutcheon,

Of the class of '24, Medical College of Virginia, recently of West Virginia, has located at 103 Arlington Avenue, Colonial Heights, Petersburg, Va., for the practice of his profession.

Coroner of South Richmond.

Dr. Sydney J. Baker has been elected coroner of South Richmond to succeed Dr. R. W. Paul who resigned just after he was appointed to fill the vacancy caused by the death of Dr. E. Govan Hill.

Opening for Physician.

Excellent opening for young wide awake physician in nice town of 1,800, good back country. Need thoroughly competent man, pleasing personality, who will stick on job. Write Prince Drug Company, Lawrenceville, Va. (Adv.)

Obituary Record

Resolutions on Death of Dr. E. Govan Hill.

The following resolutions were adopted at a meeting of the Richmond Academy of Medicine held on the 13th of October:

WHEREAS, God in His wisdom, on October 14, 1928, saw fit to remove from our midst our friend and co-worker, Doctor Edward Govan Hill, and

WHEREAS, he has been a loyal and faithful member of the Richmond Academy of Medicine for many years, during which time he enjoyed the confidence and esteem of the entire profession, and

WHEREAS, his interest in the newer contributions to medicine, particularly the treatment of diabetes, was an inspiration to those with whom he was associated, and

WHEREAS, his Christian character and beneficent influence endeared him to a large clientele. Therefore, be it

RESOLVED, that the Richmond Academy of Medicine keenly feels the loss of one of its most valuable members, and that we extend to the bereaved family our deepest sympathy in their sorrow, and be it further

RESOLVED, that these preambles and resolutions be spread upon the minutes of the Academy, that a copy be sent to the family, and that they be published in the VIRGINIA MEDICAL MONTHLY.

(Signed)

THOS. D. JONES,
WM. H. HIGGINS,
A. C. MONROE.

Dr. John M. Carrington,

A retired physician whose home was near Clover, Va., died November the 7th, at the age of sixty-eight years. He was graduated in medicine from Vanderbilt University, Nashville, Tenn., in 1885. His wife survives him.

Col. Champe Carter McCulloch, Jr.,

Of the Medical Corps of the U. S. Army, (retired), recently of Cumberland, Md., died at Walter Reed General Hospital, Washington, D. C., October 14th. He graduated in medicine from the University of Virginia in 1891, and retired in 1922 after thirty years' service in the U. S. Army.

Dr. William Nathaniel Berkeley,

A graduate of the University of Virginia, Department of Medicine, in 1891, for many years a resident of New York City, was found dead in his bed October 23rd.